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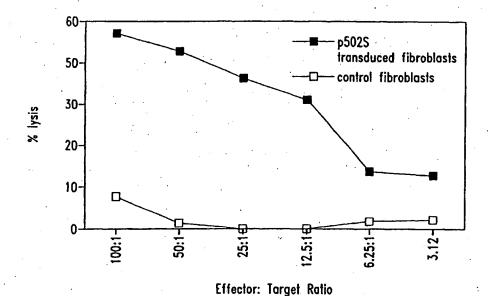
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[Continued on next page]

(54) Title: COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF PROSTATE CANCER



(57) Abstract: Compositions and methods for the therapy and diagnosis of cancer, such as prostate cancer, are disclosed. Compositions may comprise one or more prostate-specific proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a prostate-specific protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as prostate cancer. Diagnostic methods based on detecting a prostate-specific protein, or mRNA encoding such a protein, in a sample are also provided.



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COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF PROSTATE CANCER

5 TECHNICAL FIELD

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The present invention relates generally to therapy and diagnosis of cancer, such as prostate cancer. The invention is more specifically related to polypeptides comprising at least a portion of a prostate-specific protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of prostate cancer, and for the diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

Prostate cancer is the most common form of cancer among males, with an estimated incidence of 30% in men over the age of 50. Overwhelming clinical evidence shows that human prostate cancer has the propensity to metastasize to bone, and the disease appears to progress inevitably from androgen dependent to androgen refractory status, leading to increased patient mortality. This prevalent disease is currently the second leading cause of cancer death among men in the U.S.

In spite of considerable research into therapies for the disease, prostate cancer remains difficult to treat. Commonly, treatment is based on surgery and/or radiation therapy, but these methods are ineffective in a significant percentage of cases. Two previously identified prostate specific proteins - prostate specific antigen (PSA) and prostatic acid phosphatase (PAP) - have limited therapeutic and diagnostic potential. For example, PSA levels do not always correlate well with the presence of prostate cancer, being positive in a percentage of non-prostate cancer cases, including benign prostatic hyperplasia (BPH). Furthermore, PSA measurements correlate with prostate volume, and do not indicate the level of metastasis.

In spite of considerable research into therapies for these and other cancers, prostate cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

30 SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the

diagnosis and therapy of cancer, such as prostate cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a prostate-specific protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises at least an immunogenic portion of a prostate-specific protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382,384-476, 524, 526, 530, 531, 533, 535 and 536; (b) sequences that hybridize to any of the foregoing sequences under moderately stringent conditions; and (c) complements of any of the sequence of (a) or (b). In certain specific embodiments, such a polypeptide comprises at least a portion, or variant thereof, of a protein that includes an amino acid sequence selected from the group consisting of sequences recited in any one of SEQ ID NO: 112-114, 172, 176, 178, 327, 329, 331, 336, 339, 376-380, 383, 477-483, 496, 504, 505, 519, 520, 522, 525, 527, 532, 534, 537-550.

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The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a prostate-specific protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines for prophylactic or therapeutic use are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a prostate-specific protein; and (b) a physiologically acceptable carrier. In certain embodiments, the present invention provides monoclonal antibodies that specifically bind to an amino acid sequence selected from the group consisting of SEQ ID NO: 496, 504, 505, 509-517, 522 and 541-550, together with monoclonal antibodies comprising a complementarity determining region selected from the group consisting of SEQ ID NO: 502, 503 and 506-508.

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Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a prostate-specific protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a prostate-specific protein, comprising contacting T cells with one or more of:
(i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a prostate-specific protein; (ii) a polypucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

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Within further aspects, the present invention provides methods for determining the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be prostate cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain

embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

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Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

BRIEF DESCRIPTION OF THE DRAWINGS AND SEQUENCE IDENTIFIERS

Figure 1 illustrates the ability of T cells to kill fibroblasts expressing the representative prostate-specific polypeptide P502S, as compared to control fibroblasts. The percentage lysis is shown as a series of effector:target ratios, as indicated.

Figures 2A and 2B illustrate the ability of T cells to recognize cells expressing the representative prostate-specific polypeptide P502S. In each case, the number of γ -interferon spots is shown for different numbers of responders. In Figure 2A, data is presented for fibroblasts pulsed with the P2S-12 peptide, as compared to fibroblasts pulsed with a control E75 peptide. In Figure 2B, data is presented for fibroblasts expressing P502S, as compared to fibroblasts expressing HER-2/neu.

Figure 3 represents a peptide competition binding assay showing that the P1S#10 peptide, derived from P501S, binds HLA-A2. Peptide P1S#10 inhibits HLA-A2 restricted presentation of fluM58 peptide to CTL clone D150M58 in TNF release bioassay. D150M58 CTL is specific for the HLA-A2 binding influenza matrix peptide fluM58.

Figure 4 illustrates the ability of T cell lines generated from P1S#10 immunized mice to specifically lyse P1S#10-pulsed Jurkat A2Kb targets and P501S-transduced Jurkat A2Kb targets, as compared to EGFP-transduced Jurkat A2Kb. The percent lysis is shown as a series of effector to target ratios, as indicated.

Figure 5 illustrates the ability of a T cell clone to recognize and specifically lyse Jurkat A2Kb cells expressing the representative prostate-specific polypeptide P501S, thereby demonstrating that the P1S#10 peptide may be a naturally processed epitope of the P501S polypeptide.

Figures 6A and 6B are graphs illustrating the specificity of a CD8⁺ cell line (3A-1) for a representative prostate-specific antigen (P501S). Figure 6A shows the results of a ⁵¹Cr release assay. The percent specific lysis is shown as a series of effector:target ratios, as indicated. Figure 6B shows the production of interferon-gamma by 3A-1 cells stimulated with autologous B-LCL transduced with P501S, at varying effector:target rations as indicated.

Figure 7 is a Western blot showing the expression of P501S in baculovirus. Figure 8 illustrates the results of epitope mapping studies on P501S.

Figure 9 is a schematic representation of the P501S protein showing the location of transmembrane domains and predicted intracellular and extracellular domains.

Figure 10 is a genomic map showing the location of the prostate genes P775P, P704P, B305D, P712P and P774P within the Cat Eye Syndrome region of chromosome 22q11.2

Figure 11 shows the results of an ELISA assay of antibody specificity to P501S

25 peptides.

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SEQ ID NO: 1 is the determined cDNA sequence for F1-13

SEQ ID NO: 2 is the determined 3' cDNA sequence for F1-12

SEQ ID NO: 3 is the determined 5' cDNA sequence for F1-12

SEQ ID NO: 4 is the determined 3' cDNA sequence for F1-16

SEQ ID NO: 5 is the determined 3' cDNA sequence for H1-1

SEQ ID NO: 6 is the determined 3' cDNA sequence for H1-9

SEQ ID NO: 7 is the determined 3' cDNA sequence for H1-4

- SEQ ID NO: 8 is the determined 3' cDNA sequence for J1-17
- SEQ ID NO: 9 is the determined 5' cDNA sequence for J1-17
- SEQ ID NO: 10 is the determined 3' cDNA sequence for L1-12
- SEQ ID NO: 11 is the determined 5' cDNA sequence for L1-12
- SEQ ID NO: 12 is the determined 3' cDNA sequence for N1-1862
 - SEQ ID NO: 13 is the determined 5' cDNA sequence for N1-1862
 - SEQ ID NO: 14 is the determined 3' cDNA sequence for J1-13
 - SEQ ID NO: 15 is the determined 5' cDNA sequence for J1-13
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 - SEQ ID NO: 18 is the determined 3' cDNA sequence for J1-25
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- 15 SEQ ID NO: 22 is the determined 5' cDNA sequence for K1-58
 - SEQ ID NO: 23 is the determined 3' cDNA sequence for K1-58
 - SEQ ID NO: 24 is the determined 5' cDNA sequence for K1-63
 - SEQ ID NO: 25 is the determined 3' cDNA sequence for K1-63
 - SEQ ID NO: 26 is the determined 5' cDNA sequence for L1-4
- 20 SEQ ID NO: 27 is the determined 3' cDNA sequence for L1-4
 - SEQ ID NO: 28 is the determined 5' cDNA sequence for L1-14
 - SEQ ID NO: 29 is the determined 3' cDNA sequence for L1-14
 - SEQ ID NO: 30 is the determined 3' cDNA sequence for J1-12
 - SEQ ID NO: 31 is the determined 3' cDNA sequence for J1-16
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 - SEQ ID NO: 33 is the determined 3' cDNA sequence for K1-48
 - SEQ ID NO: 34 is the determined 3' cDNA sequence for K1-55
 - SEQ ID NO: 35 is the determined 3' cDNA sequence for L1-2
 - SEQ ID NO: 36 is the determined 3' cDNA sequence for L1-6
 - SEQ ID NO: 37 is the determined 3' cDNA sequence for N1-1858
 - SEQ ID NO: 38 is the determined 3' cDNA sequence for N1-1860
 - SEQ ID NO: 39 is the determined 3' cDNA sequence for N1-1861

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SEQ ID NO: 105 is the determined cDNA sequence for 1D-4296

SEQ ID NO: 106 is the determined cDNA sequence for 1D-4280

SEQ ID NO: 107 is the determined full length cDNA sequence for F1-12 (also referred to as P504S)

SEQ ID NO: 108 is the predicted amino acid sequence for F1-12

SEQ ID NO: 109 is the determined full length cDNA sequence for J1-17

SEQ ID NO: 110 is the determined full length cDNA sequence for L1-12 (also referred to as P501S)

SEQ ID NO: 111 is the determined full length cDNA sequence for N1-1862 (also referred to as

10 P503S)

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SEQ ID NO: 112 is the predicted amino acid sequence for J1-17

SEQ ID NO: 113 is the predicted amino acid sequence for L1-12 (also referred to as P501S)

SEQ ID NO: 114 is the predicted amino acid sequence for N1-1862 (also referred to as P503S)

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SEQ ID NO: 172 is the predicted amino acid sequence for P703P-DE1

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SEQ ID NO: 196 is the determined extended cDNA sequence for 1H-4766

SEQ ID NO: 197 is the determined 3' cDNA sequence for 1H-4770

SEQ ID NO: 198 is the determined 3' cDNA sequence for 1H-4771 SEQ ID NO: 199 is the determined extended cDNA sequence for 1H-4772 SEQ ID NO: 200 is the determined extended cDNA sequence for 1D-4309 SEQ ID NO: 201 is the determined extended cDNA sequence for 1D.1-4278 SEQ ID NO: 202 is the determined extended cDNA sequence for 1D-4288 SEQ ID NO: 203 is the determined extended cDNA sequence for 1D-4283 SEQ ID NO: 204 is the determined extended cDNA sequence for 1D-4304 SEQ ID NO: 205 is the determined extended cDNA sequence for 1D-4296 SEQ ID NO: 206 is the determined extended cDNA sequence for 1D-4280 SEQ ID NO: 207 is the determined cDNA sequence for 10-d8fwd 10 SEQ ID NO: 208 is the determined cDNA sequence for 10-H10con SEQ ID NO: 209 is the determined cDNA sequence for 11-C8rev SEQ ID NO: 210 is the determined cDNA sequence for 7.g6fwd SEQ ID NO: 211 is the determined cDNA sequence for 7.g6rev SEQ ID NO: 212 is the determined cDNA sequence for 8-b5fwd SEQ ID NO: 213 is the determined cDNA sequence for 8-b5rev SEQ ID NO: 214 is the determined cDNA sequence for 8-b6fwd SEQ ID NO: 215 is the determined cDNA sequence for 8-b6 rev SEQ ID NO: 216 is the determined cDNA sequence for 8-d4fwd SEQ ID NO: 217 is the determined cDNA sequence for 8-d9rev 20 SEQ ID NO: 218 is the determined cDNA sequence for 8-g3fwd SEQ ID NO: 219 is the determined cDNA sequence for 8-g3rev SEQ ID NO: 220 is the determined cDNA sequence for 8-h11rev SEQ ID NO: 221 is the determined cDNA sequence for g-f12fwd SEQ ID NO: 222 is the determined cDNA sequence for g-f3rev SEQ ID NO: 223 is the determined cDNA sequence for P509S SEQ ID NO: 224 is the determined cDNA sequence for P510S SEQ ID NO: 225 is the determined cDNA sequence for P703DE5 SEQ ID NO: 226 is the determined cDNA sequence for 9-A11 SEQ ID NO: 227 is the determined cDNA sequence for 8-C6 SEQ ID NO: 228 is the determined cDNA sequence for 8-H7 SEQ ID NO: 229 is the determined cDNA sequence for JPTPN13

SEO ID NO: 230 is the determined cDNA sequence for JPTPN14 SEQ ID NO: 231 is the determined cDNA sequence for JPTPN23 SEQ ID NO: 232 is the determined cDNA sequence for JPTPN24 SEQ ID NO: 233 is the determined cDNA sequence for JPTPN25 SEQ ID NO: 234 is the determined cDNA sequence for JPTPN30 SEQ ID NO: 235 is the determined cDNA sequence for JPTPN34 SEQ ID NO: 236 is the determined cDNA sequence for PTPN35 SEQ ID NO: 237 is the determined cDNA sequence for JPTPN36 SEQ ID NO: 238 is the determined cDNA sequence for JPTPN38 SEO ID NO: 239 is the determined cDNA sequence for JPTPN39 SEQ ID NO: 240 is the determined cDNA sequence for JPTPN40 SEQ ID NO: 241 is the determined cDNA sequence for JPTPN41. SEO ID NO: 242 is the determined cDNA sequence for JPTPN42 SEQ ID NO: 243 is the determined cDNA sequence for JPTPN45 SEQ ID NO: 244 is the determined cDNA sequence for JPTPN46 SEQ ID NO: 245 is the determined cDNA sequence for JPTPN51 SEO ID NO: 246 is the determined cDNA sequence for JPTPN56 SEO ID NO: 247 is the determined cDNA sequence for PTPN64 SEO ID NO: 248 is the determined cDNA sequence for JPTPN65 SEQ ID NO: 249 is the determined cDNA sequence for JPTPN67 SEQ ID NO: 250 is the determined cDNA sequence for JPTPN76 SEQ ID NO: 251 is the determined cDNA sequence for JPTPN84 SEQ ID NO: 252 is the determined cDNA sequence for JPTPN85 SEQ ID NO: 253 is the determined cDNA sequence for JPTPN86 SEQ ID NO: 254 is the determined cDNA sequence for JPTPN87 SEQ ID NO: 255 is the determined cDNA sequence for JPTPN88 SEQ ID NO: 256 is the determined cDNA sequence for JP1F1 SEO ID NO: 257 is the determined cDNA sequence for JP1F2 SEO ID NO: 258 is the determined cDNA sequence for JP1C2 SEQ ID NO: 259 is the determined cDNA sequence for JP1B1 SEO ID NO: 260 is the determined cDNA sequence for JP1B2 SEQ ID NO: 261 is the determined cDNA sequence for JP1D3

SEQ ID NO: 262 is the determined cDNA sequence for JP1A4 SEQ ID NO: 263 is the determined cDNA sequence for JP1F5 SEQ ID NO: 264 is the determined cDNA sequence for JP1E6 SEQ ID NO: 265 is the determined cDNA sequence for JP1D6 SEQ ID NO: 266 is the determined cDNA sequence for JP1B5 SEQ ID NO: 267 is the determined cDNA sequence for JP1A6 SEQ ID NO: 268 is the determined cDNA sequence for JP1E8 SEQ ID NO: 269 is the determined cDNA sequence for JP1D7 SEQ ID NO: 270 is the determined cDNA sequence for JP1D9 SEQ ID NO: 271 is the determined cDNA sequence for JP1C10 SEQ ID NO: 272 is the determined cDNA sequence for JP1A9 SEQ ID NO: 273 is the determined cDNA sequence for JP1F12 SEQ ID NO: 274 is the determined cDNA sequence for JP1E12 SEQ ID NO: 275 is the determined cDNA sequence for JP1D11 SEQ ID NO: 276 is the determined cDNA sequence for JP1C11 15 SEQ ID NO: 277 is the determined cDNA sequence for JP1C12 SEQ ID NO: 278 is the determined cDNA sequence for JP1B12 SEQ ID NO: 279 is the determined cDNA sequence for JP1A12 SEQ ID NO: 280 is the determined cDNA sequence for JP8G2 20 SEQ ID NO: 281 is the determined cDNA sequence for JP8H1 SEQ ID NO: 282 is the determined cDNA sequence for JP8H2 SEQ ID NO: 283 is the determined cDNA sequence for JP8A3 SEQ ID NO: 284 is the determined cDNA sequence for JP8A4 SEQ ID NO: 285 is the determined cDNA sequence for JP8C3 SEQ ID NO: 286 is the determined cDNA sequence for JP8G4 25 SEQ ID NO: 287 is the determined cDNA sequence for JP8B6 SEQ ID NO: 288 is the determined cDNA sequence for JP8D6 SEQ ID NO: 289 is the determined cDNA sequence for JP8F5 SEQ ID NO: 290 is the determined cDNA sequence for JP8A8 SEQ ID NO: 291 is the determined cDNA sequence for JP8C7 SEQ ID NO: 292 is the determined cDNA sequence for JP8D7 SEQ ID NO: 293 is the determined cDNA sequence for P8D8

SEQ ID NO: 294 is the determined cDNA sequence for JP8E7

SEQ ID NO: 295 is the determined cDNA sequence for JP8F8

SEQ ID NO: 296 is the determined cDNA sequence for JP8G8.

SEQ ID NO: 297 is the determined cDNA sequence for JP8B10

SEQ ID NO: 298 is the determined cDNA sequence for JP8C10

SEQ ID NO: 299 is the determined cDNA sequence for JP8E9

SEQ ID NO: 300 is the determined cDNA sequence for JP8E10

SEQ ID NO: 301 is the determined cDNA sequence for JP8F9

SEQ ID NO: 302 is the determined cDNA sequence for JP8H9

10 SEQ ID NO: 303 is the determined cDNA sequence for JP8C12.

SEQ ID NO: 304 is the determined cDNA sequence for JP8E11

SEQ ID NO: 305 is the determined cDNA sequence for JP8E12

SEQ ID NO: 306 is the amino acid sequence for the peptide PS2#12

SEQ ID NO: 307 is the determined cDNA sequence for P711P

15 SEQ ID NO: 308 is the determined cDNA sequence for P712P

SEQ ID NO: 309 is the determined cDNA sequence for CLONE23

SEQ ID NO: 310 is the determined cDNA sequence for P774P

SEQ ID NO: 311 is the determined cDNA sequence for P775P

SEQ ID NO: 312 is the determined cDNA sequence for P715P

20 SEQ ID NO: 313 is the determined cDNA sequence for P710P

SEQ ID NO: 314 is the determined cDNA sequence for P767P

SEQ ID NO: 315 is the determined cDNA sequence for P768P

SEQ ID NO: 316-325 are the determined cDNA sequences of previously isolated genes

SEQ ID NO: 326 is the determined cDNA sequence for P703PDE5

25 SEQ ID NO: 327 is the predicted amino acid sequence for P703PDE5

SEQ ID NO: 328 is the determined cDNA sequence for P703P6.26

SEQ ID NO: 329 is the predicted amino acid sequence for P703P6.26

SEQ ID NO: 330 is the determined cDNA sequence for P703PX-23

SEQ ID NO: 331 is the predicted amino acid sequence for P703PX-23

SEQ ID NO: 332 is the determined full length cDNA sequence for P509S

SEQ ID NO: 333 is the determined extended cDNA sequence for P707P (also referred to as 11-C9)

SEQ ID NO: 334 is the determined cDNA sequence for P714P

SEQ ID NO: 335 is the determined cDNA sequence for P705P (also referred to as 9-F3)

SEQ ID NO: 336 is the predicted amino acid sequence for P705P

SEQ ID NO: 337 is the amino acid sequence of the peptide P1S#10

SEQ ID NO: 338 is the amino acid sequence of the peptide p5

SEQ ID NO: 339 is the predicted amino acid sequence of P509S

SEQ ID NO: 340 is the determined cDNA sequence for P778P

SEQ ID NO: 341 is the determined cDNA sequence for P786P

SEQ ID NO: 342 is the determined cDNA sequence for P789P

SEQ ID NO: 343 is the determined cDNA sequence for a clone showing homology to Homo

10 sapiens MM46 mRNA

SEQ ID NO: 344 is the determined cDNA sequence for a clone showing homology to Homo sapiens TNF-alpha stimulated ABC protein (ABC50) mRNA

SEQ ID NO: 345 is the determined cDNA sequence for a clone showing homology to Homo sapiens mRNA for E-cadherin

SEQ ID NO: 346 is the determined cDNA sequence for a clone showing homology to Human nuclear-encoded mitochondrial serine hydroxymethyltransferase (SHMT)

SEQ ID NO: 347 is the determined cDNA sequence for a clone showing homology to Homo sapiens natural resistance-associated macrophage protein2 (NRAMP2)

SEQ ID NO: 348 is the determined cDNA sequence for a clone showing homology to Homo sapiens phosphoglucomutase-related protein (PGMRP)

SEQ ID NO: 349 is the determined cDNA sequence for a clone showing homology to Human mRNA for proteosome subunit p40

SEQ ID NO: 350 is the determined cDNA sequence for P777P

SEQ ID NO: 351 is the determined cDNA sequence for P779P

25 SEQ ID NO: 352 is the determined cDNA sequence for P790P

SEQ ID NO: 353 is the determined cDNA sequence for P784P

SEQ ID NO: 354 is the determined cDNA sequence for P776P.

SEQ ID NO: 355 is the determined cDNA sequence for P780P

SEQ ID NO: 356 is the determined cDNA sequence for P544S

SEQ ID NO: 357 is the determined cDNA sequence for P745S

SEQ ID NO: 358 is the determined cDNA sequence for P782P

SEQ ID NO: 359 is the determined cDNA sequence for P783P

SEQ ID NO: 360 is the determined cDNA sequence for unknown 17984

SEQ ID NO: 361 is the determined cDNA sequence for P787P

SEQ ID NO: 362 is the determined cDNA sequence for P788P

SEQ ID NO: 363 is the determined cDNA sequence for unknown 17994

SEO ID NO: 364 is the determined cDNA sequence for P781P

SEQ ID NO: 365 is the determined cDNA sequence for P785P

SEQ ID NO: 366-375 are the determined cDNA sequences for splice variants of B305D.

SEQ ID NO: 376 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 366.

10 SEQ ID NO: 377 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO:

372.

SEQ ID NO: 378 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO:

373.

SEQ ID NO: 379 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO:

15 374.

SEQ ID NO: 380 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 375.

SEQ ID NO: 381 is the determined cDNA sequence for B716P.

SEQ ID NO: 382 is the determined full-length cDNA sequence for P711P.

SEQ ID NO: 383 is the predicted amino acid sequence for P711P.

SEQ ID NO: 384 is the cDNA sequence for P1000C.

SEQ ID NO: 385 is the cDNA sequence for CGI-82.

SEQ ID NO:386 is the cDNA sequence for 23320.

SEQ ID NO:387 is the cDNA sequence for CGI-69.

25 SEQ ID NO:388 is the cDNA sequence for L-iditol-2-dehydrogenase.

SEO ID NO:389 is the cDNA sequence for 23379.

SEQ ID NO:390 is the cDNA sequence for 23381.

SEO ID NO:391 is the cDNA sequence for KIAA0122.

SEO ID NO:392 is the cDNA sequence for 23399.

30 SEQ ID NO:393 is the cDNA sequence for a previously identified gene.

SEQ ID NO:394 is the cDNA sequence for HCLBP.

SEQ ID NO:395 is the cDNA sequence for transglutaminase.

- SEQ ID NO:396 is the cDNA sequence for a previously identified gene.
- SEQ ID NO:397 is the cDNA sequence for PAP.
- SEQ ID NO:398 is the cDNA sequence for Ets transcription factor PDEF.
- SEQ ID NO:399 is the cDNA sequence for hTGR.
- 5 SEQ ID NO:400 is the cDNA sequence for KIAA0295.
 - SEQ ID NO:401 is the cDNA sequence for 22545.
 - SEQ ID NO:402 is the cDNA sequence for 22547.
 - SEQ ID NO:403 is the cDNA sequence for 22548.
 - SEQ ID NO:404 is the cDNA sequence for 22550.
- 10 SEQ ID NO:405 is the cDNA sequence for 22551.
 - SEQ ID NO:406 is the cDNA sequence for 22552.
 - SEQ ID NO:407 is the cDNA sequence for 22553.
 - SEQ ID NO:408 is the cDNA sequence for 22558.
 - SEQ ID NO:409 is the cDNA sequence for 22562.
- 15 SEQ ID NO:410 is the cDNA sequence for 22565.
 - SEQ ID NO:411 is the cDNA sequence for 22567.
 - SEQ ID NO:412 is the cDNA sequence for 22568.
 - SEQ ID NO:413 is the cDNA sequence for 22570.
 - SEQ ID NO:414 is the cDNA sequence for 22571.
- 20 SEQ ID NO:415 is the cDNA sequence for 22572.
 - SEQ ID NO:416 is the cDNA sequence for 22573.
 - SEQ ID NO:417 is the cDNA sequence for 22573.
 - SEQ ID NO:418 is the cDNA sequence for 22575.
 - SEQ ID NO:419 is the cDNA sequence for 22580.
- 25 SEQ ID NO:420 is the cDNA sequence for 22581.
 - SEQ ID NO:421 is the cDNA sequence for 22582.
 - SEQ ID NO:422 is the cDNA sequence for 22583.
 - SEQ ID NO:423 is the cDNA sequence for 22584.
 - SEQ ID NO:424 is the cDNA sequence for 22585.
- 30 SEQ ID NO:425 is the cDNA sequence for 22586.
 - SEQ ID NO:426 is the cDNA sequence for 22587.
 - SEQ ID NO:427 is the cDNA sequence for 22588.

SEQ ID NO:428 is the cDNA sequence for 22589.

SEQ ID NO:429 is the cDNA sequence for 22590.

SEQ ID NO:430 is the cDNA sequence for 22591.

SEQ ID NO:431 is the cDNA sequence for 22592.

SEQ ID NO:432 is the cDNA sequence for 22593.

SEQ ID NO:433 is the cDNA sequence for 22594.

SEQ ID NO:434 is the cDNA sequence for 22595.

SEQ ID NO:435 is the cDNA sequence for 22596.

SEQ ID NO:436 is the cDNA sequence for 22847.

0 SEQ ID NO:437 is the cDNA sequence for 22848.

SEQ ID NO:438 is the cDNA sequence for 22849.

SEQ ID NO:439 is the cDNA sequence for 22851.

SEQ ID NO:440 is the cDNA sequence for 22852.

SEQ ID NO:441 is the cDNA sequence for 22853.

SEQ ID NO:442 is the cDNA sequence for 22854.

SEQ ID NO:443 is the cDNA sequence for 22855.

SEQ ID NO:444 is the cDNA sequence for 22856.

SEQ ID NO:445 is the cDNA sequence for 22857.

SEQ ID NO:446 is the cDNA sequence for 23601.

SEQ ID NO:447 is the cDNA sequence for 23602.

SEQ ID NO:448 is the cDNA sequence for 23605.

SEQ ID NO:449 is the cDNA sequence for 23606.

SEQ ID NO:450 is the cDNA sequence for 23612.

SEQ ID NO:451 is the cDNA sequence for 23614.

25 SEQ ID NO:452 is the cDNA sequence for 23618.

SEQ ID NO:453 is the cDNA sequence for 23622.

SEQ ID NO:454 is the cDNA sequence for folate hydrolase.

SEQ ID NO:455 is the cDNA sequence for LIM protein.

SEQ ID NO:456 is the cDNA sequence for a known gene.

SEQ ID NO:457 is the cDNA sequence for a known gene.

SEQ ID NO:458 is the cDNA sequence for a previously identified gene.

SEQ ID NO:459 is the cDNA sequence for 23045.

SEQ ID NO:460 is the cDNA sequence for 23032.

SEQ ID NO:461 is the cDNA sequence for 23054.

SEQ ID NO:462-467 are cDNA sequences for known genes.

SEQ ID NO:468-471 are cDNA sequences for P710P.

5 SEQ ID NO:472 is a cDNA sequence for P1001C.

SEQ ID NO: 473 is the determined cDNA sequence for a first splice variant of P775P (referred to as 27505).

SEQ ID NO: 474 is the determined cDNA sequence for a second splice variant of P775P (referred to as 19947).

SEQ ID NO: 475 is the determined cDNA sequence for a third splice variant of P775P (referred to as 19941).

SEQ ID NO: 476 is the determined cDNA sequence for a fourth splice variant of P775P (referred to as 19937).

SEQ ID NO: 477 is a first predicted amino acid sequence encoded by the sequence of SEQ ID NO:

15 474.

SEQ ID NO: 478 is a second predicted amino acid sequence encoded by the sequence of SEQ ID NO: 474.

SEQ ID NO: 479 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 475.

SEQ ID NO: 480 is a first predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 481 is a second predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 482 is a third predicted amino acid sequence encoded by the sequence of SEQ ID NO:

25 473.

SEQ ID NO: 483 is a fourth predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 484 is the first 30 amino acids of the M. tuberculosis antigen Ra12.

SEQ ID NO: 485 is the PCR primer AW025.

30 SEQ ID NO: 486 is the PCR primer AW003.

SEQ ID NO: 487 is the PCR primer AW027.

SEQ ID NO: 488 is the PCR primer AW026.

SEQ ID NO: 489-501 are peptides employed in epitope mapping studies.

SEQ ID NO: 502 is the determined cDNA sequence of the complementarity determining region for the anti-P503S monoclonal antibody 20D4.

SEQ ID NO: 503 is the determined cDNA sequence of the complementarity determining region for the anti-P503S monoclonal antibody JA1.

SEQ ID NO: 504 & 505 are peptides employed in epitope mapping studies.

SEQ ID NO: 506 is the determined cDNA sequence of the complementarity determining region for the anti-P703P monoclonal antibody 8H2.

SEQ ID NO: 507 is the determined cDNA sequence of the complementarity determining region for the anti-P703P monoclonal antibody 7H8.

SEQ ID NO: 508 is the determined cDNA sequence of the complementarity determining region for the anti-P703P monoclonal antibody 2D4.

SEQ ID NO: 509-522 are peptides employed in epitope mapping studies.

SEQ ID NO: 523 is a mature form of P703P used to raise antibodies against P703P.SEQ ID NO:

5 524 is the putative full-length cDNA sequence of P703P.

SEQ ID NO: 525 is the predicted amino acid sequence encoded by SEQ ID NO: 524.

SEQ ID NO: 526 is the full-length cDNA sequence for P790P.

SEQ ID NO: 527 is the predicted amino acid sequence for P790P.

SEQ ID NO: 528 & 529 are PCR primers.

SEQ ID NO: 530 is the cDNA sequence of a splice variant of SEQ ID NO: 366.

SEQ ID NO: 531 is the cDNA sequence of the open reading frame of SEQ ID NO: 530.

SEQ ID NO: 532 is the predicted amino acid encoded by the sequence of SEQ ID NO: 531.

SEQ ID NO: 533 is the DNA sequence of a putative ORF of P775P.

SEQ ID NO: 534 is the predicted amino acid sequence encoded by SEQ ID NO: 533.

25 SEQ ID NO: 535 is a first full-length cDNA sequence for P510S.

SEQ ID NO: 536 is a second full-length cDNA sequence for P510S.

SEQ ID NO: 537 is the predicted amino acid sequence encoded by SEQ ID NO: 535.

SEQ ID NO: 538 is the predicted amino acid sequence encoded by SEQ ID NO: 536.

SEQ ID NO: 539 is the peptide P501S-370.

30 SEQ ID NO: 540 is the peptide P501S-376.

SEQ ID NO: 541-550 are epitopes of P501S.

SEQ ID NO: 551 corresponds to amino acids 543-553 of P501S.

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DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as prostate cancer. The compositions described herein may include prostate-specific polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (e.g., T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a prostate-specific protein or a variant thereof. A "prostate-specific protein" is a protein that is expressed in normal prostate and/or prostate tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a non-prostate normal tissue, as determined using a representative assay provided herein. Certain prostate-specific proteins are proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with prostate cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human prostate-specific proteins. Sequences of polynucleotides encoding certain prostate-specific proteins, or portions thereof, are provided in SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382, 384-476, 524, 526, 530, 531, 533, 535 and 536. Sequences of polypeptides comprising at least a portion of a prostate-specific protein are provided in SEQ ID NOs:112-114, 172, 176, 178, 327, 329, 331, 336, 339, 376-380, 383, 477-483, 496, 504, 505, 519, 520, 522, 525, 527, 532, 534 and 537-550.

PROSTATE-SPECIFIC PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a prostate-specific protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred

polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a prostate-specific protein. More preferably, a polynucleotide encodes an immunogenic portion of a prostate-specific protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (i.e., an endogenous sequence that encodes a prostate-specific protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native prostate-specific protein or a portion thereof. The term "variants" also encompasses homologous genes of xenogenic origin.

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Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices

for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenes pp. 626-645 Methods in Enzymology vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) CABIOS 5:151-153; Myers, E.W. and Muller W. (1988) CABIOS 4:11-17; Robinson, E.D. (1971) Comb. Theor 11:105; Santou, N. Nes, M. (1987) Mol. Biol. Evol. 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) Proc. Natl. Acad., Sci. USA 80:726-730.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e., gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e., the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

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Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native prostate-specific protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such

as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (i.e., expression that is at least five fold greater in a prostate-specific than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA 93*:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA 94*:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as prostate-specific cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

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An amplified portion may be used to isolate a full length gene from a suitable library (e.g., a prostate-specific cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (e.g., by nick-translation or end-labeling with ³²P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (see Sambrook et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into

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a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (see Triglia et al., Nucl. Acids Res. 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., PCR Methods Applic. 1:111-19, 1991) and walking PCR (Parker et al., Nucl. Acids. Res. 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (e.g., NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Certain nucleic acid sequences of cDNA molecules encoding at least a portion of a prostate-specific protein are provided in SEQ ID NO:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382, 384-476, 524, 526, 530, 531, 533, 535 and 536.

PCT/US00/30904 WO 01/34802

Isolation of these polynucleotides is described below. Each of these prostate-specific proteins was overexpressed in prostate tumor tissue.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (see Adelman et al., DNA 2:183, 1983). Alternatively, RNA molecules may be generated by in vitro or in vivo transcription of DNA sequences encoding a prostate-specific protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated in vivo (e.g., by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a prostate-specific polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (i.e., an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (see Gee et al., In Huber and Carr, Molecular and Immunologic Approaches, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (e.g., promoter, enhancer or transcription initiation site), and block transcription of 25 the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

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A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability in vivo. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3'

ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl- methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (e.g., avian pox virus). The polynucleotides may also be administered as naked plasmid vectors. Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

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Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

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PROSTATE-SPECIFIC POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a prostate-specific protein or a variant thereof, as described herein. As noted above, a "prostate-specific protein" is a protein that is expressed by normal prostate and/or prostate tumor cells. Proteins that are prostate-specific proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with prostate cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (i.e., specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a prostate-specific protein or a variant thereof. Certain preferred immunogenic portions include peptides-in-which-an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (e.g., 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, Fundamental Immunology, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (i.e., they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native prostate-specific protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (e.g., in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the

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immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native prostate-specific protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native prostate-specific protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (e.g., 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein. Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino

acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

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Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, higher eukaryotic and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, J. Am. Chem. Soc. 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known prostate-specific protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner),

preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

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A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., Gene 40:39-46, 1985; Murphy et al., Proc. Natl. Acad. Sci. USA 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are

located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (see, for example, Stoute et al. New Engl. J. Med., 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium Haemophilus influenza B (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (e.g., the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in E-coli-(thus-functioning-as an expression-enhancer).—The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemaglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

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In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from Streptococcus pneumoniae, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the LytA gene; Gene 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of E. coli C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (see Biotechnology 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its

original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

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The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a prostate-specific protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a prostate-specific protein if it reacts at a detectable level (within, for example, an ELISA) with a prostate-specific protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10³ L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as prostate cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a prostate-specific protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (e.g., blood, sera, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Most preferably, antibodies employed in the inventive methods have the ability to induce lysis of tumor cells by activation of complement and mediation of antibody-dependent cellular cytotoxicity (ADCC). Antibodies of different classes and subclasses differ in these properties. For example, mouse antibodies of the IgG2a and IgG3 classes are capable of activating serum complement upon binding to target cells which express the antigen against which the antibodies were raised, and can mediate ADCC.

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Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. See, e.g., Harlow and Lane, Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell-hosts, in-order-to-allow-for-the-production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, Eur. J. Immunol. 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (i.e., reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells

and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

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The preparation of mouse and rabbit monoclonal antibodies that specifically bind to polypeptides of the present invention is described in detail below. However, the antibodies of the present invention are not limited to those derived from mice. Human antibodies may also be employed in the inventive methods and may prove to be preferable. Such antibodies can be obtained using human hybridomas as described by Cote et al. (Monoclonal Antibodies and Cancer Therapy, Alan R. Lisa, p. 77, 1985). The present invention also encompasses antibodies made by recombinant means such as chimeric antibodies, wherein the variable region and constant region are derived from different species, and CDR-grafted antibodies, wherein the complementarity determining region is derived from a different species, as described in US Patents 4,816,567 and 5,225,539. Chimeric antibodies may be prepared by splicing genes for a mouse antibody molecule having a desired antigen specificity together with genes for a human antibody molecule having the desired biological activity, such as activation of human complement and mediation of ADCC (Morrison et al. Proc. Natl. Acad. Sci. USA 81:6851, 1984; Neuberger et al. Nature 312:604, 1984; Takeda et al. Nature 314:452, 1985).

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*,

Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ⁹⁰Y, ¹²³I, ¹²⁵I, ¹³¹I, ¹⁸⁶Re, ¹⁸⁸Re, ²¹¹At, and ²¹²Bi. Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diptheria toxin, cholera toxin, gelonin, Pseudomonas exotoxin, Shigella toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (e.g., covalently bonded) to a suitable monoclonal antibody either directly or indirectly (e.g., via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid-halide, or with an alkyl group containing a good leaving group (e.g., a halide) on the other.

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Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, e.g., U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (e.g., U.S. Patent No. 4,489,710, to

Spitler), by irradiation of a photolabile bond (e.g., U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (e.g., U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (e.g., U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (e.g., U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (e.g., U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (e.g., U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (e.g., U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

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Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a prostate-specific protein. Such cells may generally be prepared in vitro or ex vivo, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral

blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEXTM system, available from Nexell Therapeutics Inc., Irvine, CA (see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a prostate-specific polypeptide, polynucleotide encoding a prostate-specific polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a prostate-specific polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a prostate-specific polypeptide if the T cells specifically proliferate, secrete cytokines or kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., Cancer Res. 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (e.g., by pulselabeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a prostate-specific polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (e.g., TNF or IFN-y) is indicative of T cell activation (see Coligan et al., Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a prostate-specific polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Prostate-specific protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

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For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a prostate-specific polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a prostate-specific polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a prostate-specific polypeptide. Alternatively, one or more T cells that proliferate in the presence of a prostate-specific protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

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PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (i.e., vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant may be any substance that enhances an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (e.g., polylactic galactide) and liposomes (into which the compound is incorporated; see e.g., Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated in situ. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, Crit. Rev. Therap. Drug Carrier Systems 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression

in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as Bacillus-Calmette-Guerrin) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., Proc. Natl. Acad. Sci. USA 86:317-321, 1989; Flexner et al., Ann. N.Y. Acad. Sci. 569:86-103, 1989; Flexner et al., Vaccine 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, Biotechniques 6:616-627, 1988; Rosenfeld et al., Science 252:431-434, 1991; Kolls et al., Proc. Natl. Acad. Sci. USA 91:215-219, 1994; Kass-Eisler et al., Proc. Natl. Acad. Sci. USA 90:11498-11502, 1993; Guzman et al., Circulation 88:2838-2848, 1993; and Guzman et al., Cir. Res. 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary-skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., Science 259:1745-1749, 1993 and reviewed by Cohen, Science 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

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While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA

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or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, Bortadella pertussis or Mycobacterium tuberculosis derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (e.g., IFN-γ, TNFα, IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (e.g., IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, Ann. Rev. Immunol. 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT; see US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example,

an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (i.e., a formulation such as a capsule, sponge or gel (composed of polysaccharides for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody-dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

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Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects per se and/or to be immunologically compatible with the receiver (i.e., matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature 392*:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy,

Ann. Rev. Med. 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate in situ, with marked cytoplasmic processes (dendrites) visible in vitro), their ability to take-up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells in vivo or ex vivo, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (see Zitvogel et al., Nature Med. 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNFα to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNFα, CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

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Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcy receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (e.g., CD54 and CD11) and costimulatory molecules (e.g., CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a prostate-specific protein (or portion or other variant thereof) such that the prostate-specific polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place ex vivo, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection

that occurs in vivo. In vivo and ex vivo transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., Immunology and cell Biology 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the prostate-specific polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (e.g., vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (e.g., a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY.

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In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as prostate cancer. Within-such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer

cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth in vitro, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition in vivo are well known in the art. Such in vitro culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigenpresenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term in vivo. Studies have shown that cultured effector cells can be induced to grow in vivo and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (see, for example, Cheever et al., Immunological Reviews 157:177, 1997).

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Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated ex vivo for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (e.g., intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (e.g., by aspiration) or orally. Preferably, between 1 and 10 doses may be administered

over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (i.e., untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells in vitro. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (e.g., more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 µg to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL

In general, an appropriate dosage and treatment regimen provides—the—active—compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a prostate-specific protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

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In general, a cancer may be detected in a patient based on the presence of one or more prostate-specific proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as prostate cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer.

In general, a prostate tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. See, e.g., Harlow and Lane, Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length prostate-specific proteins and portions thereof to which the binding agent binds, as described above.

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The solid support may be any material known to those of ordinary skill in the art to which the protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a

membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 µg, and preferably about 100 ng to about 1 µg, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (see, e.g., Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

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In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20^{TM} (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (i.e., incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with prostate cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by

assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20TM. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

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To determine the presence or absence of a cancer, such as prostate cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., Clinical Epidemiology: A Basic Science for Clinical Medicine, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (i.e., sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (i.e., the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along

the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1µg, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

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Of course, numerous other assay protocols exist that are suitable for use with the proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use prostate-specific polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such prostate-specific protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a prostate-specific protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a prostate-specific polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that

expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with prostate-specific polypeptide (e.g., 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of prostate-specific polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a prostate-specific protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a prostate-specific cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the prostate-specific protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a prostate-specific protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the protein in a biological sample.

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To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a prostate-specific protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382, 384-476, 524, 526, 530, 531, 533, 535 and 536. Techniques for both PCR based assays and hybridization assays

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are well known in the art (see, for example, Mullis et al., Cold Spring Harbor Symp. Quant. Biol., 51:263, 1987; Erlich ed., PCR Technology, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain in vivo diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple prostate-specific protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a prostate-specific protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a prostate-specific protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a prostate-specific protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a prostate-specific protein.

The following Examples are offered by way of illustration and not by way of limitation.

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EXAMPLES

EXAMPLE 1

ISOLATION AND CHARACTERIZATION OF PROSTATE-SPECIFIC POLYPEPTIDES

This Example describes the isolation of certain prostate-specific polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library was constructed from prostate tumor poly A⁺ RNA using a Superscript Plasmid System for cDNA Synthesis and Plasmid Cloning kit (BRL Life Technologies, Gaithersburg, MD 20897) following the manufacturer's protocol. Specifically, prostate tumor tissues were homogenized with polytron (Kinematica, Switzerland) and total—RNA—was extracted using Trizol reagent (BRL Life Technologies) as directed by the manufacturer. The poly A⁺ RNA was then purified using a Qiagen oligotex spin-column-mRNA purification kit (Qiagen, Santa Clarita, CA 91355) according to the manufacturer's protocol. First-strand cDNA was synthesized using the Notl/Oligo-dT18 primer. Double-stranded cDNA was synthesized, ligated with EcoRI/BAXI adaptors (Invitrogen, San Diego, CA) and digested with Notl. Following size fractionation with Chroma Spin-1000 columns (Clontech, Palo Alto, CA), the cDNA was ligated into the EcoRI/Notl site of pCDNA3.1 (Invitrogen) and transformed into ElectroMax *E. coli* DH10B cells (BRL Life Technologies) by electroporation.

Using the same procedure, a normal human pancreas cDNA expression library was prepared from a pool of six tissue specimens (Clontech). The cDNA libraries were characterized by determining the number of independent colonies, the percentage of clones that carried insert, the average insert size and by sequence analysis. The prostate tumor library contained 1.64 x 10⁷ independent colonies, with 70% of clones having an insert and the average insert size being 1745 base pairs. The normal pancreas cDNA library contained 3.3 x 10⁶ independent colonies, with 69% of clones having inserts and the average insert size being 1120 base pairs. For both libraries, sequence analysis showed that the majority of clones had a full length cDNA sequence and were synthesized from mRNA, with minimal rRNA and mitochondrial DNA contamination.

cDNA library subtraction was performed using the above prostate tumor and normal pancreas cDNA libraries, as described by Hara et al. (Blood, 84:189-199, 1994) with some modifications. Specifically, a prostate tumor-specific subtracted cDNA library was generated as

follows. Normal pancreas cDNA library (70 µg) was digested with EcoRI, NotI, and SfuI, followed by a filling-in reaction with DNA polymerase Klenow fragment. After phenol-chloroform extraction and ethanol precipitation, the DNA was dissolved in 100 µl of H2O, heat-denatured and mixed with 100 µl (100 µg) of Photoprobe biotin (Vector Laboratories, Burlingame, CA). As recommended by the manufacturer, the resulting mixture was irradiated with a 270 W sunlamp on ice for 20 minutes. Additional Photoprobe biotin (50 µl) was added and the biotinylation reaction was repeated. After extraction with butanol five times, the DNA was ethanol-precipitated and dissolved in 23 µl H₂O to form the driver DNA.

To form the tracer DNA, 10 µg prostate tumor cDNA library was digested with BamHI and XhoI, phenol chloroform extracted and passed through Chroma spin-400 columns (Clontech). Following ethanol precipitation, the tracer DNA was dissolved in 5 µl H₂O. Tracer DNA was mixed with 15 µl driver DNA and 20 µl of 2 x hybridization buffer (1.5 M NaCl/10 mM EDTA/50 mM HEPES pH 7.5/0.2% sodium dodecyl sulfate), overlaid with mineral oil, and heatdenatured completely. The sample was immediately transferred into a 68 °C water bath and incubated for 20 hours (long hybridization [LH]). The reaction mixture was then subjected to a streptavidin treatment followed by phenol/chloroform extraction. This process was repeated three more times. Subtracted DNA was precipitated, dissolved in 12 µl H₂O, mixed with 8 µl driver DNA and 20 µl of 2 x hybridization buffer, and subjected to a hybridization at 68 °C for 2 hours (short hybridization [SH]). After removal of biotinylated double-stranded DNA, subtracted cDNA was ligated into BamHI/XhoI site of chloramphenicol resistant pBCSK+ (Stratagene, La Jolla, CA 92037) and transformed into ElectroMax E. coli DH10B cells by electroporation to generate a prostate tumor specific subtracted cDNA library (referred to as "prostate subtraction 1").

To analyze the subtracted cDNA library, plasmid DNA was prepared from 100 independent clones, randomly picked from the subtracted prostate tumor specific library and grouped based on insert size. Representative cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A (Foster City, CA). Six cDNA clones, hereinafter referred to as F1-13, F1-12, F1-16, H1-1, H1-9 and H1-4, were shown to be abundant in the subtracted prostate-specific cDNA library. determined 3' and 5' cDNA sequences for F1-12 are provided in SEQ ID NO: 2 and 3, respectively, 30 with determined 3' cDNA sequences for F1-13, F1-16, H1-1, H1-9 and H1-4 being provided in SEQ ID NO: 1 and 4-7, respectively.

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The cDNA sequences for the isolated clones were compared to known sequences in the gene bank using the EMBL and GenBank databases (release 96). Four of the prostate tumor cDNA clones, F1-13, F1-16, H1-1, and H1-4, were determined to encode the following previously identified proteins: prostate specific antigen (PSA), human glandular kallikrein, human tumor expression enhanced gene, and mitochondria cytochrome C oxidase subunit II. H1-9 was found to be identical to a previously identified human autonomously replicating sequence. No significant homologies to the cDNA sequence for F1-12 were found.

Subsequent studies led to the isolation of a full-length cDNA sequence for F1-12. This sequence is provided in SEQ ID NO: 107, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 108.

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To clone less abundant prostate tumor specific genes, cDNA library subtraction was performed by subtracting the prostate tumor cDNA library described above with the normal pancreas cDNA library and with the three most abundant genes in the previously subtracted prostate tumor specific cDNA library: human glandular kallikrein, prostate specific antigen—(PSA), and mitochondria cytochrome C oxidase subunit II. Specifically, 1 µg each of human glandular kallikrein, PSA and mitochondria cytochrome C oxidase subunit II cDNAs in pCDNA3.1 were added to the driver DNA and subtraction was performed as described above to provide a second subtracted cDNA library hereinafter referred to as the "subtracted prostate tumor specific cDNA library with spike".

Twenty-two cDNA clones were isolated from the subtracted prostate tumor specific cDNA library with spike. The determined 3' and 5' cDNA sequences for the clones referred to as J1-17, L1-12, N1-1862, J1-13, J1-19, J1-25, J1-24, K1-58, K1-63, L1-4 and L1-14 are provided in SEQ ID NOS: 8-9, 10-11, 12-13, 14-15, 16-17, 18-19, 20-21, 22-23, 24-25, 26-27 and 28-29, respectively. The determined 3' cDNA sequences for the clones referred to as J1-12, J1-16, J1-21, K1-48, K1-55, L1-2, L1-6, N1-1858, N1-1860, N1-1861, N1-1864 are provided in SEQ ID NOS: 30-40, respectively. Comparison of these sequences with those in the gene bank as described above, revealed no significant homologies to three of the five most abundant DNA species, (J1-17, L1-12 and N1-1862; SEQ ID NOS: 8-9, 10-11 and 12-13, respectively). Of the remaining two most abundant species, one (J1-12; SEQ ID NO:30) was found to be identical to the previously identified human pulmonary surfactant-associated protein, and the other (K1-48; SEQ ID NO:33) was determined to have some homology to *R. norvegicus* mRNA for 2-arylpropionyl-CoA epimerase. Of the 17 less abundant cDNA clones isolated from the subtracted prostate tumor specific cDNA

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library with spike, four (J1-16, K1-55, L1-6 and N1-1864; SEQ HD NOS:31, 34, 36 and 40, respectively) were found to be identical to previously identified sequences, two (J1-21 and N1-1860; SEQ ID NOS: 32 and 38, respectively) were found to show some homology to non-human sequences, and two (L1-2 and N1-1861; SEQ ID NOS: 35 and 39, respectively) were found to show some homology to known human sequences. No significant homologies were found to the polypeptides J1-13, J1-19, J1-24, J1-25, K1-58, K1-63, L1-4, L1-14 (SEQ ID NOS: 14-15, 16-17, 20-21, 18-19, 22-23, 24-25, 26-27, 28-29, respectively).

Subsequent studies led to the isolation of full length cDNA sequences for J1-17, L1-12 and N1-1862 (SEQ ID NOS: 109-111, respectively). The corresponding predicted amino acid sequences are provided in SEQ ID NOS: 112-114. L1-12 is also referred to as P501S.

In a further experiment, four additional clones were identified by subtracting a prostate tumor cDNA library with normal prostate cDNA prepared from a pool of three normal prostate poly A+ RNA (referred to as "prostate subtraction 2"). The determined cDNA sequences for these clones, hereinafter referred to as U1-3064, U1-3065, V1-3692 and 1A-3905, are provided in SEQ ID NO: 69-72, respectively. Comparison of the determined sequences with those in the gene bank revealed no significant homologies to U1-3065.

A second subtraction with spike (referred to as "prostate subtraction spike 2") was performed by subtracting a prostate tumor specific cDNA library with spike with normal pancreas cDNA library and further spiked with PSA, J1-17, pulmonary surfactant-associated protein, mitochondrial DNA, cytochrome c oxidase subunit II, N1-1862, autonomously replicating sequence, L1-12 and tumor expression enhanced gene. Four additional clones, hereinafter referred to as V1-3686, R1-2330, 1B-3976 and V1-3679, were isolated. The determined cDNA sequences for these clones are provided in SEQ ID NO:73-76, respectively. Comparison of these sequences with those in the gene bank revealed no significant homologies to V1-3686 and R1-2330.

Further analysis of the three prostate subtractions described above (prostate subtraction 2, subtracted prostate tumor specific cDNA library with spike, and prostate subtraction spike 2) resulted in the identification of sixteen additional clones, referred to as 1G-4736, 1G-4738, 1G-4741, 1G-4744, 1G-4734, 1H-4774, 1H-4781, 1H-4785, 1H-4787, 1H-4796, 1I-4810, 1I-4811, 1J-4876, 1K-4884 and 1K-4896. The determined cDNA sequences for these clones are provided in SEQ ID NOS: 77-92, respectively. Comparison of these sequences with those in the gene bank as described above, revealed no significant homologies to 1G-4741, 1G-4734, 1I-4807, 1J-4876 and 1K-4896 (SEQ ID NOS: 79, 81, 87, 90 and 92, respectively). Further analysis of the isolated

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clones led to the determination of extended cDNA sequences for 1G-4736, 1G-4738, 1G-4741, 1G-4744, 1H-4774, 1H-4781, 1H-4785, 1H-4787, 1H-4796, 1I-4807, 1J-4876, 1K-4884 and 1K-4896, provided in SEQ ID NOS: 179-188 and 191-193, respectively, and to the determination of additional partial cDNA sequences for 1I-4810 and 1I-4811, provided in SEQ ID NOS: 189 and 190, respectively.

Additional studies with prostate subtraction spike 2 resulted in the isolation of three more clones. Their sequences were determined as described above and compared to the most recent GenBank. All three clones were found to have homology to known genes, which are Cysteine-rich protein, KIAA0242, and KIAA0280 (SEQ ID NO: 317, 319, and 320, respectively). Further analysis of these clones by Synteni microarray (Synteni, Palo Alto, CA) demonstrated that all three clones were over-expressed in most prostate tumors and prostate BPH, as well as in the majority of normal prostate tissues tested, but low expression in all other normal tissues.

An additional subtraction was performed by subtracting a normal prostate cDNA library with normal pancreas cDNA (referred to as "prostate subtraction 3"). This led to the identification of six additional clones referred to as 1G-4761, 1G-4762, 1H-4766, 1H-4770, 1H-4771 and 1H-4772 (SEQ ID NOS: 93-98). Comparison of these sequences with those in the gene bank revealed no significant homologies to 1G-4761 and 1H-4771 (SEQ ID NOS: 93 and 97, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1G-4761, 1G-4762, 1H-4766 and 1H-4772 provided in SEQ ID NOS: 194-196 and 199, respectively, and to the determination of additional partial cDNA sequences for 1H-4770 and 1H-4771, provided in SEQ ID NOS: 197 and 198, respectively.

Subtraction of a prostate tumor cDNA library, prepared from a pool of polyA+ RNA from three prostate cancer patients, with a normal pancreas cDNA library (prostate subtraction 4) led to the identification of eight clones, referred to as 1D-4297, 1D-4309, 1D.1-4278, 1D-4288, 1D-4283, 1D-4304, 1D-4296 and 1D-4280 (SEQ ID NOS: 99-107). These sequences were compared to those in the gene bank as described above. No significant homologies were found to 1D-4283 and 1D-4304 (SEQ ID NOS: 103 and 104, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1D-4309, 1D.1-4278, 1D-4288, 1D-4283, 1D-4304, 1D-4296 and 1D-4280, provided in SEQ ID NOS: 200-206, respectively.

cDNA clones isolated in prostate subtraction 1 and prostate subtraction 2, described above, were colony PCR amplified and their mRNA expression levels in prostate tumor, normal prostate and in various other normal tissues were determined using microarray technology (Synteni,

Palo Alto, CA). Briefly, the PCR amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. This intensity correlates with the hybridization intensity. Two clones (referred to as P509S and P510S) were found to be over-expressed in prostate tumor and normal prostate and expressed at low levels in all other normal tissues tested (liver, pancreas, skin, bone marrow, brain, breast, adrenal gland, bladder, testes, salivary gland, large intestine, kidney, ovary, lung, spinal cord, skeletal muscle and colon). The determined cDNA sequences for P509S and P510S are provided in SEQ ID NO: 223 and 224, respectively. Comparison of these sequences with those in the gene bank as described above, revealed some homology to previously identified ESTs.

Additional, studies led to the isolation of the full-length cDNA sequence for P509S. This sequence is provided in SEQ ID NO: 332, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 339. Two variant full-length cDNA sequences for P510S are provided in SEQ ID NO: 535 and 536, with the corresponding predicted amino acid sequences being provided in SEQ ID NO: 537 and 538, respectively.

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EXAMPLE 2

DETERMINATION OF TISSUE SPECIFICITY OF PROSTATE-SPECIFIC POLYPEPTIDES

Using gene specific primers, mRNA expression levels for the representative prostate-specific polypeptides F1-16, H1-1, J1-17 (also referred to as P502S), L1-12 (also referred to as P501S), F1-12 (also referred to as P504S) and N1-1862 (also referred to as P503S) were examined in a variety of normal and tumor tissues using RT-PCR.

Briefly, total RNA was extracted from a variety of normal and tumor tissues using Trizol reagent as described above. First strand synthesis was carried out using 1-2 μ g of total RNA with SuperScript II reverse transcriptase (BRL Life Technologies) at 42 $^{\circ}$ C for one hour. The cDNA was then amplified by PCR with gene-specific primers. To ensure the semi-quantitative nature of the RT-PCR, β -actin was used as an internal control for each of the tissues examined. First, serial dilutions of the first strand cDNAs were prepared and RT-PCR assays were performed using β -actin specific primers. A dilution was then chosen that enabled the linear range amplification of the β -actin template and which was sensitive enough to reflect the differences in the initial copy numbers. Using these conditions, the β -actin levels were determined for each

reverse transcription reaction from each tissue. DNA contamination was minimized by DNase treatment and by assuring a negative PCR result when using first strand cDNA that was prepared without adding reverse transcriptase.

mRNA Expression levels were examined in four different types of tumor tissue (prostate tumor from 2 patients, breast tumor from 3 patients, colon tumor, lung tumor), and sixteen different normal tissues, including prostate, colon, kidney, liver, lung, ovary, pancreas, skeletal muscle, skin, stomach, testes, bone marrow and brain. F1-16 was found to be expressed at high levels in prostate tumor tissue, colon tumor and normal prostate, and at lower levels in normal liver, skin and testes, with expression being undetectable in the other tissues examined. H1-1 was found to be expressed at high levels in prostate tumor, lung tumor, breast tumor, normal prostate, normal colon and normal brain, at much lower levels in normal lung, pancreas, skeletal muscle, skin, small intestine, bone marrow, and was not detected in the other tissues tested. J1-17 (P502S) and L1-12 (P501S) appear to be specifically over-expressed in-prostate, with both genes being expressed at high levels in prostate tumor and normal prostate but at low to undetectable levels in all the other tissues examined. N1-1862 (P503S) was found to be over-expressed in 60% of prostate tumors and detectable in normal colon and kidney. The RT-PCR results thus indicate that F1-16, H1-1, J1-17 (P502S), N1-1862 (P503S) and L1-12 (P501S) are either prostate specific or are expressed at significantly elevated levels in prostate.

Further RT-PCR studies showed that F1-12 (P504S) is over-expressed in 60% of prostate tumors, detectable in normal kidney but not detectable in all other tissues tested. Similarly, R1-2330 was shown to be over-expressed in 40% of prostate tumors, detectable in normal kidney and liver, but not detectable in all other tissues tested. U1-3064 was found to be over-expressed in 60% of prostate tumors, and also expressed in breast and colon tumors, but was not detectable in normal tissues.

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RT-PCR characterization of R1-2330, U1-3064 and 1D-4279 showed that these three antigens are over-expressed in prostate and/or prostate tumors.

Northern analysis with four prostate tumors, two normal prostate samples, two BPH prostates, and normal colon, kidney, liver, lung, pancrease, skeletal muscle, brain, stomach, testes, small intestine and bone marrow, showed that L1-12 (P501S) is over-expressed in prostate tumors and normal prostate, while being undetectable in other normal tissues tested. J1-17 (P502S) was detected in two prostate tumors and not in the other tissues tested. N1-1862 (P503S) was found to be over-expressed in three prostate tumors and to be expressed in normal prostate, colon and kidney,

but not in other tissues tested. F1-12 (P504S) was found to be highly expressed in two prostate tumors and to be undetectable in all other tissues tested.

The microarray technology described above was used to determine the expression levels of representative antigens described herein in prostate tumor, breast tumor and the following normal tissues: prostate, liver, pancreas, skin, bone marrow, brain, breast, adrenal gland, bladder, testes, salivary gland, large intestine, kidney, ovary, lung, spinal cord, skeletal muscle and colon. L1-12 (P501S) was found to be over-expressed in normal prostate and prostate tumor, with some expression being detected in normal skeletal muscle. Both J1-12 and F1-12 (P504S) were found to be over-expressed in prostate tumor, with expression being lower or undetectable in all other tissues tested. N1-1862 (P503S) was found to be expressed at high levels in prostate tumor and normal prostate, and at low levels in normal large intestine and normal colon, with expression being undetectable in all other tissues tested. R1-2330 was found to be over-expressed in prostate tumor and normal prostate, and to be expressed at lower levels in all other tissues tested. 1D-4279 was found to be over-expressed in prostate tumor and normal prostate, expressed at lower levels in normal spinal cord, and to be undetectable in all other tissues tested.

Further microarray analysis to specifically address the extent to which P501S (SEQ ID NO: 110) was expressed in breast tumor revealed moderate over-expression not only in breast tumor, but also in metastatic breast tumor (2/31), with negligible to low expression in normal tissues. This data suggests that P501S may be over-expressed in various breast tumors as well as in prostate tumors.

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The expression levels of 32 ESTs (expressed sequence tags) described by Vasmatzis et al. (Proc. Natl. Acad. Sci. USA 95:300-304, 1998) in a variety of tumor and normal tissues were examined by microarray technology as described above. Two of these clones (referred to as P1000C and P1001C) were found to be over-expressed in prostate tumor and normal prostate, and expressed at low to undetectable levels in all other tissues tested (normal aorta, thymus, resting and activated PBMC, epithelial cells, spinal cord, adrenal gland, fetal tissues, skin, salivary gland, large intestine, bone marrow, liver, lung, dendritic cells, stomach, lymph nodes, brain, heart, small intestine, skeletal muscle, colon and kidney. The determined cDNA sequences for P1000C and P1001C are provided in SEQ ID NO: 384 and 472, respectively. The sequence of P1001C was found to show some homology to the previously isolated Human mRNA for JM27 protein. No significant homologies were found to the sequence of P1000C.

The expression of the polypeptide encoded by the full length cDNA sequence for F1-12 (also referred to as P504S; SEQ ID NO: 108) was investigated by immunohistochemical analysis. Rabbit-anti-P504S polyclonal antibodies were generated against the full length P504S protein by standard techniques. Subsequent isolation and characterization of the polyclonal antibodies were also performed by techniques well known in the art. Immunohistochemical analysis showed that the P504S polypeptide was expressed in 100% of prostate carcinoma samples tested (n=5).

The rabbit-anti-P504S polyclonal antibody did not appear to label benign prostate cells with the same cytoplasmic granular staining, but rather with light nuclear staining. Analysis of normal tissues revealed that the encoded polypeptide was found to be expressed in some, but not all normal human tissues. Positive cytoplasmic staining with rabbit-anti-P504S polyclonal antibody was found in normal human kidney, liver, brain, colon and lung-associated macrophages, whereas heart and bone marrow were negative.

This data indicates that the P504S polypeptide is present in-prostate cancer tissues, and that there are qualitative and quantitative differences in the staining between benign prostatic hyperplasia tissues and prostate cancer tissues, suggesting that this polypeptide may be detected selectively in prostate tumors and therefore be useful in the diagnosis of prostate cancer.

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EXAMPLE 3

ISOLATION AND CHARACTERIZATION OF PROSTATE-SPECIFIC POLYPEPTIDES BY PCR-BASED SUBTRACTION

ten other normal tissue cDNAs (brain, heart, kidney, liver, lung, ovary, placenta, skeletal muscle, spleen and thymus) and then submitted to a first round of PCR amplification, was purchased from Clontech. This library was subjected to a second round of PCR amplification, following the manufacturer's protocol. The resulting cDNA fragments were subcloned into the vector pT7 Blue T-vector (Novagen, Madison, WI) and transformed into XL-1 Blue MRF' E. coli (Stratagene).

DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A.

Fifty-nine positive clones were sequenced. Comparison of the DNA sequences of these clones with those in the gene bank, as described above, revealed no significant homologies to 25 of these clones, hereinafter referred to as P5, P8, P9, P18, P20, P30, P34, P36, P38, P39, P42, P49, P50, P53, P55, P60, P64, P65, P73, P75, P76, P79 and P84. The determined cDNA sequences for these clones are provided in SEQ ID NO: 41-45, 47-52 and 54-65, respectively. P29, P47, P68, P80 and P82 (SEQ ID NO: 46, 53 and 66-68, respectively) were found to show some degree of homology to previously identified DNA sequences. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in prostate.

Further studies using the PCR-based methodology described above resulted in the isolation of more than 180 additional clones, of which 23 clones were found to show no significant homologies to known sequences. The determined cDNA sequences for these clones are provided in SEQ ID NO: 115-123, 127, 131, 137, 145, 147-151, 153, 156-158 and 160. Twenty-three clones (SEQ ID NO: 124-126, 128-130, 132-136, 138-144, 146, 152, 154, 155 and 159) were found to show some homology to previously identified ESTs. An additional ten clones (SEQ ID NO: 161-170) were found to have some degree of homology to known genes. Larger cDNA clones containing the P20 sequence represent splice variants of a gene referred to as P703P. The determined DNA sequence for the variants referred to as DE1, DE13 and DE14 are provided in SEQ ID NOS: 171, 175 and 177, respectively, with the corresponding predicted amino acid sequences being provided in SEQ ID NO: 172, 176 and 178, respectively. The determined cDNA sequence for an extended spliced form of P703 is provided in SEQ ID NO: 225. The DNA sequences for the splice variants referred to as DE2 and DE6 are provided in SEQ ID NOS: 173 and 174, respectively.

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mRNA Expression levels for representative clones in tumor tissues (prostate (n=5), breast (n=2), colon and lung) normal tissues (prostate (n=5), colon, kidney, liver, lung (n=2), ovary (n=2), skeletal muscle, skin, stomach, small intestine and brain), and activated and non-activated PBMC was determined by RT-PCR as described above. Expression was examined in one sample of each tissue type unless otherwise indicated.

P9 was found to be highly expressed in normal prostate and prostate tumor compared to all normal tissues tested except for normal colon which showed comparable expression. P20, a portion of the P703P gene, was found to be highly expressed in normal prostate and prostate tumor, compared to all twelve normal tissues tested. A modest increase in expression of P20 in breast tumor (n=2), colon tumor and lung tumor was seen compared to all normal tissues except lung (1 of

2). Increased expression of P18 was found in normal prostate, prostate tumor and breast tumor compared to other normal tissues except lung and stomach. A modest increase in expression of P5 was observed in normal prostate compared to most other normal tissues. However, some elevated expression was seen in normal lung and PBMC. Elevated expression of P5 was also observed in prostate tumors (2 of 5), breast tumor and one lung tumor sample. For P30, similar expression levels were seen in normal prostate and prostate tumor, compared to six of twelve other normal tissues tested. Increased expression was seen in breast tumors, one lung tumor sample and one colon tumor sample, and also in normal PBMC. P29 was found to be over-expressed in prostate tumor (5 of 5) and normal prostate (5 of 5) compared to the majority of normal tissues. However, substantial expression of P29 was observed in normal colon and normal lung (2 of 2). P80 was found to be over-expressed in prostate tumor (5 of 5) and normal prostate (5 of 5) compared to all other normal tissues tested, with increased expression also being seen in colon tumor.

Further studies resulted in the isolation of twelve additional clones, hereinafter referred to as 10-d8, 10-h10, 11-c8, 7-g6, 8-b5, 8-b6, 8-d4, 8-d9, 8-g3, 8-h11, 9-f12 and 9-f3. The determined DNA sequences for 10-d8, 10-h10, 11-c8, 8-d4, 8-d9, 8-h11, 9-f12 and 9-f3 are provided in SEQ ID NO: 207, 208, 209, 216, 217, 220, 221 and 222, respectively. The determined forward and reverse DNA sequences for 7-g6, 8-b5, 8-b6 and 8-g3 are provided in SEQ ID NO: 210 and 211; 212 and 213; 214 and 215; and 218 and 219, respectively. Comparison of these sequences with those in the gene bank revealed no significant homologies to the sequence of 9-f3. The clones 10-d8, 11-c8 and 8-h11 were found to show some homology to previously isolated ESTs, while 10-h10, 8-b5, 8-b6, 8-d4, 8-d9, 8-g3 and 9-f12 were found to show some homology to previously identified genes. Further characterization of 7-G6 and 8-G3 showed identity to the known genes PAP and PSA, respectively.

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mRNA expression levels for these clones were determined using the micro-array technology described above. The clones 7-G6, 8-G3, 8-B5, 8-B6, 8-D4, 8-D9, 9-F3, 9-F12, 9-H3, 10-A2, 10-A4, 11-C9 and 11-F2 were found to be over-expressed in prostate tumor and normal prostate, with expression in other tissues tested being low or undetectable. Increased expression of 8-F11 was seen in prostate tumor and normal prostate, bladder, skeletal muscle and colon. Increased expression of 10-H10 was seen in prostate tumor and normal prostate, bladder, lung, colon, brain and large intestine. Increased expression of 9-B1 was seen in prostate tumor, breast tumor, and normal prostate, salivary gland, large intestine and skin, with increased expression of 11-C8 being seen in prostate tumor, and normal prostate and large intestine.

An additional cDNA fragment derived from the PCR-based normal prostate subtraction, described above, was found to be prostate specific by both micro-array technology and RT-PCR. The determined cDNA sequence of this clone (referred to as 9-A11) is provided in SEQ ID NO: 226. Comparison of this sequence with those in the public databases revealed 99% identity to the known gene HOXB13.

Further studies led to the isolation of the clones 8-C6 and 8-H7. The determined cDNA sequences for these clones are provided in SEQ ID NO: 227 and 228, respectively. These sequences were found to show some homology to previously isolated ESTs.

PCR and hybridization-based methodologies were employed to obtain longer cDNA sequences for clone P20 (also referred to as P703P), yielding three additional cDNA fragments that progressively extend the 5' end of the gene. These fragments, referred to as P703PDE5, P703P6.26, and P703PX-23 (SEQ ID NO: 326, 328 and 330, with the predicted corresponding amino acid sequences being provided in SEQ ID NO: 327, 329 and 331, respectively) contain additional 5' sequence. P703PDE5 was recovered by screening of a cDNA library (#141-26) with a portion of P703P as a probe. P703P6.26 was recovered from a mixture of three prostate tumor cDNAs and P703PX_23 was recovered from cDNA library (#438-48). Together, the additional sequences include all of the putative mature serine protease along with part of the putative signal sequence. The putative full-length cDNA sequence for P703P is provided in SEQ ID NO: 524, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 525.

Further studies using a PCR-based subtraction library of a prostate tumor pool subtracted against a pool of normal tissues (referred to as JP: PCR subtraction) resulted in the isolation of thirteen additional clones, seven of which did not share any significant homology to known GenBank sequences. The determined cDNA sequences for these seven clones (P711P, P712P, novel 23, P774P, P775P, P710P and P768P) are provided in SEQ ID NO: 307-311, 313 and 315, respectively. The remaining six clones (SEQ ID NO: 316 and 321-325) were shown to share some homology to known genes. By microarray analysis, all thirteen clones showed three or more fold over-expression in prostate tissues, including prostate tumors, BPH and normal prostate as compared to normal non-prostate tissues. Clones P711P, P712P, novel 23 and P768P showed over-expression in most prostate tumors and BPH tissues tested (n=29), and in the majority of normal prostate tissues (n=4), but background to low expression levels in all normal tissues. Clones P774P, P775P and P710P showed comparatively lower expression and expression in fewer prostate tumors and BPH samples, with negative to low expression in normal prostate.

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The full-length cDNA for P711P was obtained by employing the partial sequence of SEQ ID NO: 307 to screen a prostate cDNA library. Specifically, a directionally cloned prostate cDNA library was prepared using standard techniques. One million colonies of this library were plated onto LB/Amp plates. Nylon membrane filters were used to lift these colonies, and the cDNAs which were picked up by these filters were denatured and cross-linked to the filters by UV light. The P711P cDNA fragment of SEQ ID NO: 307 was radio-labeled and used to hybridize with these filters. Positive clones were selected, and cDNAs were prepared and sequenced using an automatic Perkin Elmer/Applied Biosystems sequencer. The determined full-length sequence of P711P is provided in SEQ ID NO: 382, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 383.

Using PCR and hybridization-based methodologies, additional cDNA sequence information was derived for two clones described above, 11-C9 and 9-F3, herein after referred to as P707P and P714P, respectively (SEQ ID NO: 333 and 334). After comparison with the most recent GenBank, P707P was found to be a splice variant of the known gene HoxB13. In contrast, no significant homologies to P714P were found.

Clones 8-B3, P89, P98, P130 and P201 (as disclosed in U.S. Patent Application No. 09/020,956, filed February 9, 1998) were found to be contained within one contiguous sequence, referred to as P705P (SEQ ID NO: 335, with the predicted amino acid sequence provided in SEQ ID NO: 336), which was determined to be a splice variant of the known gene NKX 3.1.

Further studies on P775P resulted in the isolation of four additional sequences (SEQ ID NO: 473-476) which are all splice variants of the P775P gene. The sequence of SEQ ID NO: 474 was found to contain two open reading frames (ORFs). The predicted amino acid sequences encoded by these ORFs are provided in SEQ ID NO: 477 and 478. The cDNA sequence of SEQ ID NO: 475 was found to contain an ORF which encodes the amino acid sequence of SEQ ID NO: 479. The cDNA sequence of SEQ ID NO: 473 was found to contain four ORFs. The predicted amino acid sequences encoded by these ORFs are provided in SEQ ID NO: 480-483.

Subsequent studies led to the identification of a genomic region on chromosome 22q11.2, known as the Cat Eye Syndrome region, that contains the five prostate genes P704P, P712P, P774P, P775P and B305D. The relative location of each of these five genes within the genomic region is shown in Fig. 10. This region may therefore be associated with malignant tumors, and other potential tumor genes may be contained within this region. These studies also led

to the identification of a potential open reading frame (ORF) for P775P (provided in SEQ ID NO: 533), which encodes the amino acid sequence of SEQ ID NO: 534.

EXAMPLE 4 SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems 430A using FMOC chemistry with HPTU (O-Benzotriazole-N,N,N',N'peptide synthesizer tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the ! following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

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EXAMPLE 5

FURTHER ISOLATION AND CHARACTERIZATION OF PROSTATE-SPECIFIC POLYPEPTIDES BY PCR-BASED SUBTRACTION

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A cDNA library generated from prostate primary tumor mRNA as described above was subtracted with cDNA from normal prostate. The subtraction was performed using a PCR-based protocol (Clontech), which was modified to generate larger fragments. Within this protocol, tester and driver double stranded cDNA were separately digested with five restriction enzymes that recognize six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in an average cDNA size of 600 bp, rather than the average size of 300 bp that results from digestion with RsaI according to the Clontech protocol. This modification did not affect the

subtraction efficiency. Two tester populations were then created with different adapters, and the driver library remained without adapters.

The tester and driver libraries were then hybridized using excess driver cDNA. In the first hybridization step, driver was separately hybridized with each of the two tester cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs and (d) unhybridized driver cDNAs. The two separate hybridization reactions were then combined, and rehybridized in the presence of additional denatured driver cDNA. Following this second hybridization, in addition to populations (a) through (d), a fifth population (e) was generated in which tester cDNA with one adapter hybridized to tester cDNA with the second adapter. Accordingly, the second hybridization step resulted in enrichment of differentially expressed sequences which could be used as templates for PCR amplification with adaptor-specific primers.

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The ends were then filled in, and PCR amplification was performed using adaptor-specific primers. Only population (e), which contained tester cDNA that did not hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are overexpressed in prostate tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

In addition to genes known to be overexpressed in prostate tumor, seventy-seven further clones were identified. Sequences of these partial cDNAs are provided in SEQ ID NO: 29 to 305. Most of these clones had no significant homology to database sequences. Exceptions were JPTPN23 (SEQ ID NO: 231; similarity to pig valosin-containing protein), JPTPN30 (SEQ ID NO: 234; similarity to rat mRNA for proteasome subunit), JPTPN45 (SEQ ID NO: 243; similarity to rat norvegicus cytosolic NADP-dependent isocitrate dehydrogenase), JPTPN46 (SEQ ID NO: 244; similarity to human subclone H8 4 d4 DNA sequence), JP1D6 (SEQ ID NO: 265; similarity to G. gallus dynein light chain-A), JP8D6 (SEQ ID NO: 288; similarity to human BAC clone RG016J04), JP8F5 (SEQ ID NO: 289; similarity to human subclone H8 3 b5 DNA sequence), and JP8E9 (SEQ ID NO: 299; similarity to human Alu sequence).

Additional studies using the PCR-based subtraction library consisting of a prostate tumor pool subtracted against a normal prostate pool (referred to as PT-PN PCR subtraction) yielded three additional clones. Comparison of the cDNA sequences of these clones with the most

recent release of GenBank revealed no significant homologies to the two clones referred to as P715P and P767P (SEQ ID NO: 312 and 314). The remaining clone was found to show some homology to the known gene KIAA0056 (SEQ ID NO: 318). Using microarray analysis to measure mRNA expression levels in various tissues, all three clones were found to be over-expressed in prostate tumors and BPH tissues. Specifically, clone P715P was over-expressed in most prostate tumors and BPH tissues by a factor of three or greater, with elevated expression seen in the majority of normal prostate samples and in fetal tissue, but negative to low expression in all other normal tissues. Clone P767P was over-expressed in several prostate tumors and BPH tissues, with moderate expression levels in half of the normal prostate samples, and background to low expression in all other normal tissues tested.

Further analysis, by microarray as described above, of the PT-PN PCR subtraction library and of a DNA subtraction library containing cDNA from prostate tumor subtracted with a pool of normal tissue cDNAs, led to the isolation of 27 additional clones (SEQ ID NO: 340-365 and 381) which were determined to be over-expressed in prostate tumor. The clones of SEQ ID NO: 341, 342, 345, 347, 348, 349, 351, 355-359, 361, 362 and 364 were also found to be expressed in normal prostate. Expression of all 26 clones in a variety of normal tissues was found to be low or undetectable, with the exception of P544S (SEQ ID NO: 356) which was found to be expressed in small intestine. Of the 26 clones, 10 (SEQ ID NO: 340-349) were found to show some homology to previously identified sequences. No significant homologies were found to the clones of SEQ ID NO: 350, 351 and 353-365.

Further studies on the clone of SEQ ID NO: 352 (referred to as P790P) led to the isolation of the full-length cDNA sequence of SEQ ID NO: 526. The corresponding predicted amino acid is provided in SEQ ID NO: 527. Data from two quantitative PCR experiments indicated that P790P is over-expressed in 11/15 tested prostate tumor samples and is expressed at low levels in spinal cord, with no expression being seen in all other normal samples tested. Data from further PCR experiments and microarray experiments showed over-expression in normal prostate and prostate tumor with little or no expression in other tissues tested. P790P was subsequently found to show significant homology to a previously identified G-protein coupled prostate tissue receptor.

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EXAMPLE 6

PEPTIDE PRIMING OF MICE AND PROPAGATION OF CTL LINES

6.1. This Example illustrates the preparation of a CTL cell line specific for cells expressing the P502S gene.

Mice expressing the transgene for human HLA A2Kb (provided by Dr L. Sherman, The Scripps Research Institute, La Jolla, CA) were immunized with P2S#12 peptide (VLGWVAEL; SEQ ID NO: 306), which is derived from the P502S gene (also referred to herein as J1-17, SEQ ID NO: 8), as described by Theobald et al., Proc. Natl. Acad. Sci. USA 92:11993-11997, 1995 with the following modifications. Mice were immunized with 100µg of P2S#12 and 120µg of an I-Ab binding peptide derived from hepatitis B Virus protein emulsified in incomplete Freund's adjuvant. Three weeks later these mice were sacrificed and using a nylon mesh single cell suspensions prepared. Cells were then resuspended at 6 x 106 cells/ml in complete media (RPMI-1640; Gibco BRL, Gaithersburg, MD) containing 10% FCS, 2mM Glutamine (Gibco BRL), sodium pyruvate (Gibco BRL), non-essential amino acids (Gibco BRL), 2 x 10-5 M 2-mercaptoethanol, 50U/ml penicillin and streptomycin, and cultured in the presence of irradiated (3000 rads) P2S#12-pulsed (5mg/ml P2S#12 and 10mg/ml β2-microglobulin) LPS blasts (A2 transgenic spleens cells cultured in the presence of 7µg/ml dextran sulfate and 25µg/ml LPS for 3 days). Six days later, cells (5 x 105/ml) were restimulated with 2.5 x 106/ml peptide pulsed irradiated (20,000 rads) EL4A2Kb cells (Sherman et al, Science 258:815-818, 1992) and 3 x 106/ml A2 transgenic spleen feeder cells. Cells were cultured in the presence of 20U/ml IL-2. Cells continued to be restimulated on a weekly basis as described, in preparation for cloning the line.

P2S#12 line was cloned by limiting dilution analysis with peptide pulsed EL4 A2Kb tumor cells (1 x 10⁴ cells/ well) as stimulators and A2 transgenic spleen cells as feeders (5 x 10⁵ cells/ well) grown in the presence of 30U/ml IL-2. On day 14, cells were restimulated as before. On day 21, clones that were growing were isolated and maintained in culture. Several of these clones demonstrated significantly higher reactivity (lysis) against human fibroblasts (HLA A2Kb expressing) transduced with P502S than against control fibroblasts. An example is presented in Figure 1.

This data indicates that P2S #12 represents a naturally processed epitope of the P502S protein that is expressed in the context of the human HLA A2Kb molecule.

6.2. This Example illustrates the preparation of murine CTL lines and CTL clones specific for cells expressing the P501S gene.

This series of experiments were performed similarly to that described above. Mice were immunized with the P1S#10 peptide (SEQ ID NO: 337), which is derived from the P501S gene (also referred to herein as L1-12, SEQ ID NO: 110). The P1S#10 peptide was derived by analysis of the predicted polypeptide sequence for P501S for potential HLA-A2 binding sequences as defined by published HLA-A2 binding motifs (Parker, KC, et al, J. Immunol., 152:163, 1994). P1S#10 peptide was synthesized as described in Example 4, and empirically tested for HLA-A2 binding using a T cell based competition assay. Predicted A2 binding peptides were tested for their ability to compete HLA-A2 specific peptide presentation to an HLA-A2 restricted CTL clone (D150M58), which is specific for the HLA-A2 binding influenza matrix peptide fluM58. D150M58 CTL secretes TNF in response to self-presentation of peptide fluM58. In the competition assay, test peptides at 100-200 µg/ml were added to cultures of D150M58 CTL in order to bind HLA-A2 on the CTL. After thirty minutes, CTL cultured with test peptides, or control peptides, were tested for their antigen dose response to the fluM58 peptide in a standard TNF bioassay. As shown in Figure 3, peptide P1S#10 competes HLA-A2 restricted presentation of fluM58, demonstrating that peptide P1S#10 binds HLA-A2.

Mice expressing the transgene for human HLA A2Kb were immunized as described by Theobald et al. (*Proc. Natl. Acad. Sci. USA 92*:11993-11997, 1995) with the following modifications. Mice were immunized with 62.5μg of P1S #10 and 120μg of an I-A^b binding peptide derived from Hepatitis B Virus protein emulsified in incomplete Freund's adjuvant. Three weeks later these mice were sacrificed and single cell suspensions prepared using a nylon mesh. Cells were then resuspended at 6 x 10⁶ cells/ml in complete media (as described above) and cultured in the presence of irradiated (3000 rads) P1S#10-pulsed (2μg/ml P1S#10 and 10mg/ml β2-microglobulin) LPS blasts (A2 transgenic spleens cells cultured in the presence of 7μg/ml dextran sulfate and 25μg/ml LPS for 3 days). Six days later cells (5 x 10⁵/ml) were restimulated with 2.5 x 10⁶/ml peptide-pulsed irradiated (20,000 rads) EL4A2Kb cells, as described above, and 3 x 10⁶/ml A2 transgenic spleen feeder cells. Cells were cultured in the presence of 20 U/ml IL-2. Cells were restimulated on a weekly basis in preparation for cloning. After three rounds of *in vitro* stimulations, one line was generated that recognized P1S#10-pulsed Jurkat A2Kb targets and P501S-transduced Jurkat targets as shown in Figure 4.

A P1S#10-specific CTL line was cloned by limiting dilution analysis with peptide pulsed EL4 A2Kb tumor cells (1 x 10⁴ cells/ well) as stimulators and A2 transgenic spleen cells as feeders (5 x 10⁵ cells/ well) grown in the presence of 30U/ml IL-2. On day 14, cells were restimulated as before. On day 21, viable clones were isolated and maintained in culture. As shown in Figure 5, five of these clones demonstrated specific cytolytic reactivity against P501S-transduced Jurkat A2Kb targets. This data indicates that P1S#10 represents a naturally processed epitope of the P501S protein that is expressed in the context of the human HLA-A2.1 molecule.

EXAMPLE 7

PRIMING OF CTL IN VIVO USING NAKED DNA IMMUNIZATION

WITH A PROSTATE ANTIGEN

The prostate-specific antigen L1-12, as described above, is also referred to as P501S. HLA A2Kb-Tg mice (provided-by-Dr-L. Sherman, The Scripps Research Institute, La Jolla, CA) were immunized with 100 µg P501S in the vector VR1012 either intramuscularly or intradermally. The mice were immunized three times, with a two week interval between immunizations. Two weeks after the last immunization, immune spleen cells were cultured with Jurkat A2Kb-P501S transduced stimulator cells. CTL lines were stimulated weekly. After two weeks of *in vitro* stimulation, CTL activity was assessed against P501S transduced targets. Two out of 8 mice developed strong anti-P501S CTL responses. These results demonstrate that P501S contains at least one naturally processed HLA-A2-restricted CTL epitope.

EXAMPLE 8

ABILITY OF HUMAN T CELLS TO RECOGNIZE PROSTATE-SPECIFIC POLYPEPTIDES

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This Example illustrates the ability of T cells specific for a prostate tumor polypeptide to recognize human tumor.

Human CD8⁺ T cells were primed *in vitro* to the P2S-12 peptide (SEQ ID NO: 306) derived from P502S (also referred to as J1-17) using dendritic cells according to the protocol of Van Tsai et al. (*Critical Reviews in Immunology 18*:65-75, 1998). The resulting CD8⁺ T cell microcultures were tested for their ability to recognize the P2S-12 peptide presented by autologous fibroblasts or fibroblasts which were transduced to express the P502S gene in a γ-interferon

ELISPOT assay (see Lalvani et al., J. Exp. Med. 186:859-865, 1997). Briefly, titrating numbers of T cells were assayed in duplicate on 10⁴ fibroblasts in the presence of 3 μg/ml human β₂microglobulin and 1 µg/ml P2S-12 peptide or control E75 peptide. In addition, T cells were simultaneously assayed on autologous fibroblasts transduced with the P502S gene or as a control, fibroblasts transduced with HER-2/neu. Prior to the assay, the fibroblasts were treated with 10 ng/ml γ-interferon for 48 hours to upregulate class I MHC expression. One of the microcultures (#5) demonstrated strong recognition of both peptide pulsed fibroblasts as well as transduced fibroblasts in a γ-interferon ELISPOT assay. Figure 2A demonstrates that there was a strong increase in the number of γ -interferon spots with increasing numbers of T cells on fibroblasts pulsed with the P2S-12 peptide (solid bars) but not with the control E75 peptide (open bars). This shows the ability of these T cells to specifically recognize the P2S-12 peptide. As shown in Figure 2B, this microculture also demonstrated an increase in the number of γ -interferon spots with increasing numbers of T cells on fibroblasts transduced to express the P502S gene but not the HER-2/neu gene. These results provide additional confirmatory evidence that the P2S-12 peptide is a naturally processed epitope of the P502S protein. Furthermore, this also demonstrates that there exists in the human T cell repertoire, high affinity T cells which are capable of recognizing this epitope. These T cells should also be capable of recognizing human tumors which express the P502S gene.

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EXAMPLE 9

ELICITATION OF PROSTATE ANTIGEN-SPECIFIC CTL RESPONSES IN HUMAN BLOOD

This Example illustrates the ability of a prostate-specific antigen to elicit a CTL response in blood of normal humans.

Autologous dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal donors by growth for five days in RPMI medium containing 10% human serum, 50 ng/ml GMCSF and 30 ng/ml IL-4. Following culture, DC were infected overnight with recombinant P501S-expressing vaccinia virus at an M.O.I. of 5 and matured for 8 hours by the addition of 2 micrograms/ml CD40 ligand. Virus was inactivated by UV irradiation, CD8+ cells were isolated by positive selection using magnetic beads, and priming cultures were initiated in 24-well plates. Following five stimulation cycles using autologous fibroblasts retrovirally transduced

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to express P501S and CD80, CD8+ lines were identified that specifically produced interferongamma when stimulated with autologous P501S-transduced fibroblasts. The P501S-specific activity of cell line 3A-1 could be maintained following additional stimulation cycles on autologous B-LCL transduced with P501S. Line 3A-1 was shown to specifically recognize autologous B-LCL transduced to express P501S, but not EGFP-transduced autologous B-LCL, as measured by cytotoxicity assays (51Cr release) and interferon-gamma production (Interferon-gamma Elispot; see above and Lalvani et al., J. Exp. Med. 186:859-865, 1997). The results of these assays are presented in Figures 6A and 6B.

EXAMPLE 10

IDENTIFICATION OF A NATURALLY PROCESSED CTL EPITOPE CONTAINED WITHIN A PROSTATE-SPECIFIC ANTIGEN

The 9-mer peptide p5 (SEQ ID NO: 338) was derived from the P703P antigen-(alsoreferred to as P20). The p5 peptide is immunogenic in human HLA-A2 donors and is a naturally processed epitope. Antigen specific human CD8+ T cells can be primed following repeated in vitro stimulations with monocytes pulsed with p5 peptide. These CTL specifically recognize p5-pulsed and P703P-transduced target cells in both ELISPOT (as described above) and chromium release assays. Additionally, immunization of HLA-A2Kb transgenic mice with p5 leads to the generation of CTL lines which recognize a variety of HLA-A2Kb or HLA-A2 transduced target cells expressing P703P.

Initial studies demonstrating that p5 is a naturally processed epitope were done using HLA-A2Kb transgenic mice. HLA-A2Kb transgenic mice were immunized subcutaneously in the footpad with 100 µg of p5 peptide together with 140 µg of hepatitis B virus core peptide (a Th 25 peptide) in Freund's incomplete adjuvant. Three weeks post immunization, spleen cells from immunized mice were stimulated in vitro with peptide-pulsed LPS blasts. CTL activity was assessed by chromium release assay five days after primary in vitro stimulation. Retrovirally transduced cells expressing the control antigen P703P and HLA-A2Kb were used as targets. CTL lines that specifically recognized both p5-pulsed targets as well as P703P-expressing targets were identified.

Human in vitro priming experiments demonstrated that the p5 peptide is immunogenic in humans. Dendritic cells (DC) were differentiated from monocyte cultures derived

from PBMC of normal human donors by culturing for five days in RPMI medium containing 10% human serum, 50 ng/ml human GM-CSF and 30 ng/ml human IL-4. Following culture, the DC were pulsed with 1 ug/ml p5 peptide and cultured with CD8+ T cell enriched PBMC. CTL lines were restimulated on a weekly basis with p5-pulsed monocytes. Five to six weeks after initiation of the CTL cultures, CTL recognition of p5-pulsed target cells was demonstrated. CTL were additionally shown to recognize human cells transduced to express P703P, demonstrating that p5 is a naturally processed epitope.

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EXAMPLE 11

EXPRESSION OF A BREAST TUMOR-DERIVED ANTIGEN

IN PROSTATE

Isolation of the antigen B305D from breast tumor by differential display is described in US Patent Application No. 08/700,014, filed August 20, 1996. Several different splice forms of this antigen were isolated. The determined cDNA sequences for these splice forms are provided in SEQ ID NO: 366-375, with the predicted amino acid sequences corresponding to the sequences of SEQ ID NO: 292, 298 and 301-303 being provided in SEQ ID NO: 299-306, respectively. In further studies, a splice variant of the cDNA sequence of SEQ ID NO: 366 was isolated which was found to contain an additional guanine residue at position 884 (SEQ ID NO: 530), leading to a frameshift in the open reading frame. The determined DNA sequence of this ORF is provided in SEQ ID NO: 531. This frameshift generates a protein sequence (provided in SEQ ID NO: 532) of 293 amino acids that contains the C-terminal domain common to the other isoforms of B305D but that differs in the N-terminal region.

The expression levels of B305D in a variety of tumor and normal tissues were examined by real time PCR and by Northern analysis. The results indicated that B305D is highly expressed in breast tumor, prostate tumor, normal prostate and normal testes, with expression being low or undetectable in all other tissues examined (colon tumor, lung tumor, ovary tumor, and normal bone marrow, colon, kidney, liver, lung, ovary, skin, small intestine, stomach).

EXAMPLE 12

GENERATION OF HUMAN CTL IN VITRO USING WHOLE GENE PRIMING AND STIMULATION TECHNIQUES WITH PROSTATE-SPECIFIC ANTIGEN

Using in vitro whole-gene priming with P501S-vaccinia infected DC (see, for example, Yee et al, The Journal of Immunology, 157(9):4079-86, 1996), human CTL lines were derived that specifically recognize autologous fibroblasts transduced with P501S (also known as L1-12), as determined by interferon-y ELISPOT analysis as described above. Using a panel of HLA-mismatched B-LCL lines transduced with P501S, these CTL lines were shown to be likely restricted to HLAB class I allele. Specifically, dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal human donors by growing for five days in RPMI medium containing 10% human serum, 50 ng/ml human GM-CSF and 30 ng/ml human IL-4. Following culture, DC were infected overnight with recombinant P501S vaccinia virus at a multiplicity of infection (M.O.I) of five, and matured overnight by the addition of 3 µg/ml CD40 ligand. Virus was inactivated by UV irradiation. CD8+ T cells were isolated using a magnetic bead system, and priming cultures were initiated using standard culture techniques. Cultures were restimulated every 7-10 days using autologous primary fibroblasts retrovirally transduced with P501S and CD80. Following four stimulation cycles, CD8+T cell-lines were identified that specifically produced interferon-y when stimulated with P501S and CD80-transduced autologous fibroblasts. A panel of HLA-mismatched B-LCL lines transduced with P501S were generated to define the restriction allele of the response. By measuring interferon-y in an ELISPOT assay, the P501S specific response was shown to be likely restricted by HLA B alleles. These results demonstrate that a CD8+ CTL response to P501S can be elicited.

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To identify the epitope(s) recognized, cDNA encoding P501S was fragmented by various restriction digests, and sub-cloned into the retroviral expression vector pBIB-KS. Retroviral supernatants were generated by transfection of the helper packaging line Phoenix-Ampho. Supernatants were then used to transduce Jurkat/A2Kb cells for CTL screening. CTL were screened in IFN-gamma ELISPOT assays against these A2Kb targets transduced with the "library" of P501S fragments. Initial positive fragments P501S/H3 and P501S/F2 were sequenced and found to encode amino acids 106-553 and amino acids 136-547, respectively, of SEQ ID NO: 113. A truncation of H3 was made to encode amino acid residues 106-351 of SEQ ID NO: 113, which was unable to stimulate the CTL, thus localizing the epitope to amino acid residues 351-547. Additional fragments encoding amino acids 1-472 (Fragment A) and amino acids 1-351 (Fragment B) were also constructed. Fragment A but not Fragment B stimulated the CTL thus localizing the epitope to amino acid residues 351-472. Overlapping 20-mer and 18-mer peptides representing this region were tested by pulsing Jurkat/A2Kb cells versus CTL in an IFN-gamma assay. Only peptides

P501S-369(20) and P501S-369(18) stimulated the CTL. Nine-mer and 10-mer peptides representing this region were synthesized and similarly tested. Peptide P501S-370 (SEQ ID NO: 539) was the minimal 9-mer giving a strong response. Peptide P501S-376 (SEQ ID NO: 540) also gave a weak response, suggesting that it might represent a cross-reactive epitope.

In subsequent studies, the ability of primary human B cells transduced with P501S to prime MHC class I-restricted, P501S-specific, autologous CD8 T cells was examined. Primary B cells were derived from PBMC of a homozygous HLA-A2 donor by culture in CD40 ligand and IL-4, transduced at high frequency with recombinant P501S in the vector pBIB, and selected with blastocidin-S. For in vitro priming, purified CD8+ T cells were cultured with autologous CD40 ligand + IL-4 derived, P501S-transduced B cells in a 96-well microculture format. These CTL microcultures were re-stimulated with P501S-transduced B cells and then assayed for specificity. Following this initial screen, microcultures with significant signal above background were cloned on autologous EBV-transformed B cells (BLCL), also transduced with P501S. Using IFN-gamma ELISPOT for detection, several of these CD8 T cell clones were found to be specific for P501S, as demonstrated by reactivity to BLCL/P501S but not BLCL transduced with control antigen. It was further demonstrated that the anti-P501S CD8 T cell specificity is HLA-A2-restricted. First, antibody blocking experiments with anti-HLA-A,B,C monoclonal antibody (W6.32), anti-HLA-B,C monoclonal antibody (B1.23.2) and a control monoclonal antibody showed that only the anti-HLA-A,B,C antibody blocked recognition of P501S-expressing autologous BLCL. Secondly, the anti-P501S CTL also recognized an HLA-A2 matched, heterologous BLCL transduced with P501S, but not the corresponding EGFP transduced control BLCL.

EXAMPLE 13

IDENTIFICATION OF PROSTATE-SPECIFIC ANTIGENS BY MICROARRAY ANALYSIS

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This Example describes the isolation of certain prostate-specific polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library as described above was screened using microarray analysis to identify clones that display at least a three fold over-expression in prostate tumor and/or normal prostate tissue, as compared to non-prostate normal tissues (not including testis). 372 clones were identified, and 319 were successfully sequenced. Table I presents a summary of these clones, which are shown in SEQ ID NOs:385-400. Of these sequences

SEQ ID NOs:386, 389, 390 and 392 correspond to novel genes, and SEQ ID NOs: 393 and 396 correspond to previously identified sequences. The others (SEQ ID NOs:385, 387, 388, 391, 394, 395 and 397-400) correspond to known sequences, as shown in Table I.

Table I
Summary of Prostate Tumor Antigens

Known Genes	Previously Identified Genes	Novel Genes
T-cell gamma chain	P504S	23379 (SEQ ID NO:389)
Kallikrein	P1000C	23399 (SEQ ID NO:392)
Vector	P501S	23320 (SEQ ID NO:386)
CGI-82 protein mRNA (23319; SEQ ID NO:385)	P503S	23381 (SEQ ID NO:390)
PSA	P510S	t analogicament in the terresistant and a last over the
Ald. 6 Dehyd.	P784P	
L-iditol-2 dehydrogenase (23376; SEQ ID NO:388)	P502S	, y., ,
Ets transcription factor PDEF (22672; SEQ ID NO:398)	P706P	
hTGR (22678; SEQ ID NO:399)	19142.2, bangur.seq (22621; SEQ ID NO:396)	
KIAA0295(22685; SEQ ID NO:400)	5566.1 Wang (23404; SEQ ID NO:393)	
Prostatic Acid Phosphatase(22655; SEQ ID NO:397)	P712P	
transglutaminase (22611; SEQ ID NO:395)	P778P	
HDLBP (23508; SEQ ID NO:394)		
CGI-69 Protein(23367; SEQ ID NO:387)	×	
KIAA0122(23383; SEQ ID NO:391)		
TEEG		

CGI-82 showed 4.06 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 43% of prostate tumors, 25% normal prostate, not detected in other normal tissues tested. L-iditol-2 dehydrogenase showed 4.94 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 90% of prostate tumors, 100% of normal prostate, and not detected in other normal tissues tested. Ets transcription factor PDEF showed 5.55 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 47% prostate tumors, 25% normal prostate and not detected in other normal tissues tested. hTGR1 showed 9.11 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 63% of prostate tumors and is not detected in normal tissues tested including normal prostate. KIAA0295 showed 5.59 fold overexpression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 47% of prostate tumors, low to undetectable in normal tissues tested including normal prostate Prostatic acid phosphatase showed 9.14 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 67% of prostate tumors, 50% of normal prostate, and not detected in other normal tissues tested. Transglutaminase showed 14.84 fold over-expression in prostate tissues as compared to other normal tissues tested. It was overexpressed in 30% of prostate tumors, 50% of normal prostate, and is not detected in other normal tissues tested. High density lipoprotein binding protein (HDLBP) showed 28.06 fold overexpression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors, 75% of normal prostate, and is undetectable in all other normal tissues tested. CGI-69 showed 3.56 fold over-expression in prostate tissues as compared to other normal tissues tested. It is a low abundant gene, detected in more than 90% of prostate tumors, and in 75% normal prostate tissues. The expression of this gene in normal tissues was very low. KIAA0122 showed 4.24 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 57% of prostate tumors, it was undetectable in all normal tissues tested including normal prostate tissues. 19142.2 bangur showed 23.25 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors and 100% of normal prostate. It was undetectable in other normal tissues tested. 5566.1 Wang showed 3.31 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors, 75% normal prostate and was also over-expressed in normal bone marrow, pancreas, and activated PBMC. Novel clone 23379 showed 4.86 fold overexpression in prostate tissues as compared to other normal tissues tested. It was detectable in 97%

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of prostate tumors and 75% normal prostate and is undetectable in all other normal tissues tested. Novel clone 23399 showed 4.09 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 27% of prostate tumors and was undetectable in all normal tissues tested including normal prostate tissues. Novel clone 23320 showed 3.15 fold over-expression in prostate tissues as compared to other normal tissues tested. It was detectable in all prostate tumors and 50% of normal prostate tissues. It was also expressed in normal colon and trachea. Other normal tissues do not express this gene at high level.

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EXAMPLE 14

IDENTIFICATION OF PROSTATE-SPECIFIC ANTIGENS BY ELECTRONIC SUBTRACTION

This Example describes the use of an electronic subtraction technique to identify prostate-specific antigens.

Potential prostate-specific genes present in the GenBank human EST database were identified by electronic subtraction (similar to that described by Vasmatizis et al., *Proc. Natl. Acad. Sci. USA* 95:300-304, 1998). The sequences of EST clones (43,482) derived from various prostate libraries were obtained from the GenBank public human EST database. Each prostate EST sequence was used as a query sequence in a BLASTN (National Center for Biotechnology Information) search against the human EST database. All matches considered identical (length of matching sequence >100 base pairs, density of identical matches over this region > 70%) were grouped (aligned) together in a cluster. Clusters containing more than 200 ESTs were discarded since they probably represented repetitive elements or highly expressed genes such as those for ribosomal proteins. If two or more clusters shared common ESTs, those clusters were grouped together into a "supercluster," resulting in 4,345 prostate superclusters.

Records for the 479 human cDNA libraries represented in the GenBank release were downloaded to create a database of these cDNA library records. These 479 cDNA libraries were grouped into three groups: Plus (normal prostate and prostate tumor libraries, and breast cell line libraries, in which expression was desired), Minus (libraries from other normal adult tissues, in which expression was not desirable), and Other (libraries from fetal tissue, infant tissue, tissues found only in women, non-prostate tumors and cell lines other than prostate cell lines, in which

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expression was considered to be irrelevant). A summary of these library groups is presented in Table II.

<u>Table II</u>
Prostate cDNA Libraries and ESTs

Library	# of Libraries	# of ESTs	
Plus	25	43,482	
Normal	11	18,875	
Tumor	11	21,769	
Cell lines	3	2,838	
Minus'	166		
Other	287	0.	

Each supercluster was analyzed in terms of the ESTs within the supercluster. The tissue source of each EST clone was noted and used to classify the superclusters into four groups: Type 1- EST clones found in the Plus group libraries only; no expression detected in Minus or Other group libraries; Type 2- EST clones derived from the Plus and Other group libraries only; no expression detected in the Minus group; Type 3- EST clones derived from the Plus, Minus and Other group libraries, but the number of ESTs derived from the Plus group is higher than in either the Minus or Other groups; and Type 4- EST clones derived from Plus, Minus and Other group libraries, but the number derived from the Plus group is higher than the number derived from the Minus group. This analysis identified 4,345 breast clusters (see Table III). From these clusters, 3,172 EST clones were ordered from Research Genetics, Inc., and were received as frozen glycerol stocks in 96-well plates.

<u>Table III</u>

<u>Prostate Cluster Summary</u>

Туре	# of Superclusters	# of ESTs Ordered
1	688	677
2	2899	2484
3	85	11
4	673	0
Total	4345	3172

The EST clone inserts were PCR-amplified using amino-linked PCR primers for Synteni microarray analysis. When more than one PCR product was obtained for a particular clone, that PCR product was not used for expression analysis. In total, 2,528 clones from the electronic subtraction method were analyzed by microarray analysis to identify electronic subtraction breast clones that had high levels of tumor vs. normal tissue mRNA. Such screens were performed using a Synteni (Palo Alto, CA) microarray, according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA 93*:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA 94*:2150-2155, 1997). Within these analyses, the clones were arrayed on the chip, which was then probed with fluorescent probes generated from normal and tumor prostate cDNA, as well as various other normal tissues. The slides were scanned and the fluorescence intensity was measured.

Clones with an expression ratio greater than 3 (i.e., the level in prostate tumor and normal prostate mRNA was at least three times the level in other normal tissue mRNA) were identified as prostate tumor-specific sequences (Table IV). The sequences of these clones are provided in SEQ ID NO: 401-453, with certain novel sequences shown in SEQ ID NO: 407, 413, 416-419, 422, 426, 427 and 450.

<u>Table IV</u> <u>Prostate-tumor Specific Clones</u>

SEQ ID NO.	Sequence	Comments	
	Designation		
401	22545	previously identified P1000C	
402	22547	previously identified P704P	
403	22548	known	
404	22550	known	
405	22551	PSA	
406	22552	prostate secretory protein 94	
407	22553	novel	
408	22558	previously identified P509S	
409	22562	glandular kallikrein	
410	22565	previously identified P1000C	
411	22567	PAP	
412	22568	B1006C (breast tumor antigen)	
413	22570	novel	
414	22571	PSA	
415	22572	previously identified P706P	
416	22573	novel	
417	22574	novel	
418	22575	novel	
419	22580	novel	
420	22581	PAP	
421	22582	prostatic secretory protein 94	
422	22583	novel	
423	22584	prostatic secretory protein 94	
424	22585	prostatic secretory protein 94	
425	22586	known	
426	22587	novel	
427	22588	novel	
428	22589	PAP	
429	22590	known	
430	22591	PSA	
431	22592	known	
432	22593	Previously identified P777P	
433	22594	T cell receptor gamma chain	
43.4	22595	Previously identified P705P	
435	22596	Previously identified P707P	
436	22847	· · · · · · · · PAP	
437	22848	known	
438	22849	prostatic secretory protein 57	
439	22851	PAP	

440	22852	PAP
441	22853	PAP
442	22854	previously identified P509S
443	22855	previously identified P705P
444	22856	previously identified P774P
445	22857	PSA
446	23601	previously identified P777P
447	23602	PSA
448	23605	PSA
449	23606	PSA
450	23612	novel
451	23614	PSA
452	23618	previously identified P1000C
453	23622	previously identified P705P

EXAMPLE 15

FURTHER IDENTIFICATION OF PROSTATE-SPECIFIC-ANTIGENS-BY-MICROARRAY ANALYSIS

This Example describes the isolation of additional prostate-specific polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library as described above was screened using microarray analysis to identify clones that display at least a three fold over-expression in prostate tumor and/or normal prostate tissue, as compared to non-prostate normal tissues (not including testis). 142 clones were identified and sequenced. Certain of these clones are shown in SEQ ID NO: 454-467. Of these sequences, SEQ ID NO: 459-461 represent novel genes. The others (SEQ ID NO: 454-458 and 461-467) correspond to known sequences.

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EXAMPLE 16

FURTHER CHARACTERIZATION OF PROSTATE-SPECIFIC ANTIGEN P710P

This Example describes the full length cloning of P710P.

The prostate cDNA library described above was screened with the P710P fragment described above. One million colonies were plated on LB/Ampicillin plates. Nylon membrane

filters were used to lift these colonies, and the cDNAs picked up by these filters were then denatured and cross-linked to the filters by UV light. The P710P fragment was radiolabeled and used to hybridize with the filters. Positive cDNA clones were selected and their cDNAs recovered and sequenced by an automatic Perkin Elmer/Applied Biosystems Division Sequencer. Four sequences were obtained, and are presented in SEQ ID NO: 468-471 These sequences appear to represent different splice variants of the P710P gene.

EXAMPLE 17

PROTEIN EXPRESSION OF THE PROSTATE-SPECIFIC ANTIGEN P501S

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This example describes the expression and purification of the prostate-specific antigen P501S in *E. coli*, baculovirus and mammalian cells.

a) Expression in E. coli

Expression of the full-length form of P501S was attempted by first cloning P501S without the leader sequence (amino acids 36-553 of SEQ ID NO: 113) downstream of the first 30 amino acids of the *M. tuberculosis* antigen Ra12 (SEQ ID NO: 484) in pET17b. Specifically, P501S DNA was used to perform PCR using the primers AW025 (SEQ ID NO: 485) and AW003 (SEQ ID NO: 486). AW025 is a sense cloning primer that contains a HindIII site. AW003 is an antisense cloning primer that contains an EcoRI site. DNA amplification was performed using 5 μl 10X Pfu buffer, 1 μl 20 mM dNTPs, 1 μl each of the PCR primers at 10 μM concentration, 40 μl water, 1 μl Pfu DNA polymerase (Stratagene, La Jolla, CA) and 1 μl DNA at 100 ng/μl. Denaturation at 95°C was performed for 30 sec, followed by 10 cycles of 95°C for 30 sec, 60°C for 1 min and by 72°C for 3 min, and lastly by 1 cycle of 72°C for 10 min. The PCR product was cloned to Ra12m/pET17b using HindIII and EcoRI. The sequence of the resulting fusion construct (referred to as Ra12-P501S-F) was confirmed by DNA sequencing.

The fusion construct was transformed into BL21(DE3)pLysE, pLysS and CodonPlus E. coli (Stratagene) and grown overnight in LB broth with kanamycin. The resulting culture was induced with IPTG. Protein was transferred to PVDF membrane and blocked with 5% non-fat milk (in PBS-Tween buffer), washed three times and incubated with mouse anti-His tag antibody (Clontech) for 1 hour. The membrane was washed 3 times and probed with HRP-Protein A

(Zymed) for 30 min. Finally, the membrane was washed 3 times and developed with ECL (Amersham). No expression was detected by Western blot. Similarly, no expression was detected by Western blot when the Ra12-P501S-F fusion was used for expression in BL21CodonPlus by CE6 phage (Invitrogen).

An N-terminal fragment of P501S (amino acids 36-325 of SEQ ID NO: 113) was cloned down-stream of the first 30 amino acids of the *M. tuberculosis* antigen Ra12 in pET17b as follows. P501S DNA was used to perform PCR using the primers AW025 (SEQ ID NO: 485) and AW027 (SEQ ID NO: 487). AW027 is an antisense cloning primer that contains an EcoRI site and a stop codon. DNA amplification was performed essentially as described above. The resulting PCR product was cloned to Ra12 in pET17b at the HindIII and EcoRI sites. The fusion construct (referred to as Ra12-P501S-N) was confirmed by DNA sequencing.

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The Ra12-P501S-N fusion construct was used for expression in BL21(DE3)pLysE, pLysS and CodonPlus, essentially as described above. Using Western blot analysis, protein bands were observed at the expected molecular weight of 36 kDa. Some high molecular weight bands were also observed, probably due to aggregation of the recombinant protein. No expression was detected by Western blot when the Ra12-P501S-F fusion was used for expression in BL21CodonPlus by CE6 phage.

A fusion construct comprising a C-terminal portion of P501S (amino acids 257-553 of SEQ ID NO: 113) located down-stream of the first 30 amino acids of the *M. tuberculosis* antigen Ra12 (SEQ ID NO: 484) was prepared as follows. P501S DNA was used to perform PCR using the primers AW026 (SEQ ID NO: 488) and AW003 (SEQ ID NO: 486). AW026 is a sense cloning primer that contains a HindIII site. DNA amplification was performed essentially as described above. The resulting PCR product was cloned to Ra12 in pET17b at the HindIII and EcoRI sites. The sequence for the fusion construct (referred to as Ra12-P501S-C) was confirmed.

The Ra12-P501S-C fusion construct was used for expression in BL21(DE3)pLysE, pLysS and CodonPlus, as described above. A small amount of protein was detected by Western blot, with some molecular weight aggregates also being observed. Expression was also detected by Western blot when the Ra12-P501S-C fusion was used for expression in BL21CodonPlus induced by CE6 phage.

b) Expression of P501S in Baculovirus

The Bac-to-Bac baculovirus expression system (BRL Life Technologies, Inc.) was used to express P501S protein in insect cells. Full-length P501S (SEQ ID NO: 113) was amplified by PCR and cloned into the XbaI site of the donor plasmid pFastBacI. The recombinant bacmid and baculovirus were prepared according to the manufacturer's isntructions. The recombinant baculovirus was amplified in Sf9 cells and the high titer viral stocks were utilized to infect High Five cells (Invitrogen) to make the recombinant protein. The identity of the full-length protein was confirmed by N-terminal sequencing of the recombinant protein and by Western blot analysis (Figure 7). Specifically, 0.6 million High Five cells in 6-well plates were infected with either the unrelated control virus BV/ECD_PD (lane 2), with recombinant baculovirus for P501S at different amounts or MOIs (lanes 4-8), or were uninfected (lane 3). Cell lysates were run on SDS-PAGE under reducing conditions and analyzed by Western blot with the anti-P501S monoclonal antibody P501S-10E3-G4D3 (prepared as described below). Lane 1 is the biotinylated protein molecular weight marker (BioLabs).

The localization of recombinant P501S in the insect cells was investigated as follows. The insect cells overexpressing P501S were fractionated into fractions of nucleus, mitochondria, membrane and cytosol. Equal amounts of protein from each fraction were analyzed by Western blot with a monoclonal antibody against P501S. Due to the scheme of fractionation, both nucleus and mitochondria fractions contain some plasma membrane components. However, the membrane fraction is basically free from mitochondria and nucleus. P501S was found to be present in all fractions that contain the membrane component, suggesting that P501S may be associated with plasma membrane of the insect cells expressing the recombinant protein.

25 c) Expression of P501S in mammalian cells

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Full-length P501S (553AA) was cloned into various mammalian expression vectors, including pCEP4 (Invitrogen), pVR1012 (Vical, San Diego, CA) and a modified form of the retroviral vector pBMN, referred to as pBIB. Transfection of P501S/pCEP4 and P501S/pVR1012 into HEK293 fibroblasts was carried out using the Fugene transfection reagent (Boehringer Mannheim). Briefly, 2 ul of Fugene reagent was diluted into 100 ul of serum-free media and incubated at room temperature for 5-10 min. This mixture was added to 1 ug of P501S plasmid DNA, mixed briefly and incubated for 30 minutes at room temperature. The Fugene/DNA mixture

was added to cells and incubated for 24-48 hours. Expression of recombinant P501S in transfected HEK293 fibroblasts was detected by means of Western blot employing a monoclonal antibody to P501S.

Transfection of p501S/pCEP4 into CHO-K cells (American Type Culture Collection, Rockville, MD) was carried out using GenePorter transfection reagent (Gene Therapy Systems, San Diego, CA). Briefly, 15 µl of GenePorter was diluted in 500 µl of serum-free media and incubated at room temperature for 10 min. The GenePorter/media mixture was added to 2 µg of plasmid DNA that was diluted in 500 µl of serum-free media, mixed briefly and incubated for 30 min at room temperature. CHO-K cells were rinsed in PBS to remove serum proteins, and the GenePorter/DNA mix was added and incubated for 5 hours. The transfected cells were then fed an equal volume of 2x media and incubated for 24-48 hours.

FACS analysis of P501S transiently infected CHO-K cells, demonstrated surface expression of P501S. Expression was detected using rabbit polyclonal antisera raised against a P501S peptide, as described below. Flow cytometric analysis was performed using a FaCScan (Becton Dickinson), and the data were analyzed using the Cell Quest program.

EXAMPLE 18

PREPARATION AND CHARACTERIZATION OF ANTIBODIES AGAINST PROSTATE-SPECIFIC POLYPEPTIDES

20 a) Preparation and Characterization of Antibodies against P501S

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A murine monoclonal antibody directed against the carboxy-terminus of the prostate-specific antigen P501S was prepared as follows.

A truncated fragment of P501S (amino acids 355-526 of SEQ ID NO: 113) was generated and cloned into the pET28b vector (Novagen) and expressed in *E. coli* as a thioredoxin fusion protein with a histidine tag. The trx-P501S fusion protein was purified by nickel chromatography, digested with thrombin to remove the trx fragment and further purified by an acid precipitation procedure followed by reverse phase HPLC.

Mice were immunized with truncated P501S protein. Serum bleeds from mice that potentially contained anti-P501S polyclonal sera were tested for P501S-specific reactivity using ELISA assays with purified P501S and trx-P501S proteins. Serum bleeds that appeared to react specifically with P501S were then screened for P501S reactivity by Western analysis. Mice that contained a P501S-specific antibody component were sacrificed and spleen cells were used to

generate anti-P501S antibody producing hybridomas using standard techniques. Hybridoma supernatants were tested for P501S-specific reactivity initially by ELISA, and subsequently by FACS analysis of reactivity with P501S transduced cells. Based on these results, a monoclonal hybridoma referred to as 10E3 was chosen for further subcloning. A number of subclones were generated, tested for specific reactivity to P501S using ELISA and typed for IgG isotype. The results of this analysis are shown below in Table V. Of the 16 subclones tested, the monoclonal antibody 10E3-G4-D3 was selected for further study.

<u>Table V</u>

Isotype analysis of murine anti-P501S monoclonal antibodies

Hybridoma clone	Isotype	Estimated [Ig] in supernatant (µg/ml)
4D11	IgG1	14.6
1G1	IgGl	0.6
4F6	IgG1	72
4H5	IgG1	13.8
4H5-E12	IgG1	10.7
4H5-EH2	IgG1	9.2
4H5-H2-A10	IgG1	10
4H5-H2-A3	IgG1	12.8
4H5-H2-A10-G6	IgG1	13.6
4H5-H2-B11	IgG1	12.3
10E3	IgG2a	3.4
10E3-D4	IgG2a	3.8
10E3-D4-G3	IgG2a	9.5
10E3-D4-G6	IgG2a	10.4
10E3-E7	IgG2a	6.5
8H12	IgG2a	0.6

The specificity of 10E3-G4-D3 for P501S was examined by FACS analysis.

Specifically, cells were fixed (2% formaldehyde, 10 minutes), permeabilized (0.1% saponin, 10 minutes) and stained with 10E3-G4-D3 at 0.5 - 1 µg/ml, followed by incubation with a secondary, FITC-conjugated goat anti-mouse Ig antibody (Pharmingen, San Diego, CA). Cells were then analyzed for FITC fluorescence using an Excalibur fluorescence activated cell sorter. For FACS analysis of transduced cells, B-LCL were retrovirally transduced with P501S. For analysis of infected cells, B-LCL were infected with a vaccinia vector that expresses P501S. To demonstrate

specificity in these assays, B-LCL transduced with a different antigen (P703P) and uninfected B-LCL vectors were utilized. 10E3-G4-D3 was shown to bind with P501S-transduced B-LCL and also with P501S-infected B-LCL, but not with either uninfected cells or P703P-transduced cells.

To determine whether the epitope recognized by 10E3-G4-D3 was found on the surface or in an intracellular compartment of cells, B-LCL were transduced with P501S or HLA-B8 as a control antigen and either fixed and permeabilized as described above or directly stained with 10E3-G4-D3 and analyzed as above. Specific recognition of P501S by 10E3-G4-D3 was found to require permeabilization, suggesting that the epitope recognized by this antibody is intracellular.

The reactivity of 10E3-G4-D3 with the three prostate tumor cell lines Lncap, PC-3 and DU-145, which are known to express high, medium and very low levels of P501S, respectively, was examined by permeabilizing the cells and treating them as described above. Higher reactivity of 10E3-G4-D3 was seen with Lncap than with PC-3, which in turn showed higher reactivity that DU-145. These results are in agreement with the real time PCR and demonstrate that the antibody specifically recognizes P501S in these tumor cell lines and that the epitope recognized in prostate tumor cell lines is also intracellular.

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Specificity of 10E3-G4-D3 for P501S was also demonstrated by Western blot analysis. Lysates from the prostate tumor cell lines Lncap, DU-145 and PC-3, from P501S-transfected HEK293 cells, and from non-transfected HEK293 cells were generated. Western blot analysis of these lysates with 10E3-G4-D3 revealed a 46 kDa immunoreactive band in Lncap, PC-3 and P501S-transfected HEK cells, but not in DU-145 cells or non-transfected HEK293 cells. P501S mRNA expression is consistent with these results since semi-quantitative PCR analysis revealed that P501S mRNA is expressed in Lncap, to a lesser but detectable level in PC-3 and not at all in DU-145 cells. Bacterially expressed and purified recombinant P501S (referred to as P501SStr2) was recognized by 10E3-G4-D3 (24 kDa), as was full-length P501S that was transiently expressed in HEK293 cells using either the expression vector VR1012 or pCEP4. Although the predicted molecular weight of P501S is 60.5 kDa, both transfected and "native" P501S run at a slightly lower mobility due to its hydrophobic nature.

Immunohistochemical analysis was performed on prostate tumor and a panel of normal tissue sections (prostate, adrenal, breast, cervix, colon, duodenum, gall bladder, ileum, kidney, ovary, pancreas, parotid gland, skeletal muscle, spleen and testis). Tissue samples were fixed in formalin solution for 24 hours and embedded in paraffin before being sliced into 10 micron sections. Tissue sections were permeabilized and incubated with 10E3-G4-D3 antibody for 1 hr.

HRP-labeled anti-mouse followed by incubation with DAB chromogen was used to visualize P501S immunoreactivity. P501S was found to be highly expressed in both normal prostate and prostate tumor tissue but was not detected in any of the other tissues tested.

To identify the epitope recognized by 10E3-G4-D3, an epitope mapping approach was pursued. A series of 13 overlapping 20-21 mers (5 amino acid overlap; SEO ID NO: 489-501) was synthesized that spanned the fragment of P501S used to generate 10E3-G4-D3. Flat bottom 96 well microtiter plates were coated with either the peptides or the P501S fragment used to immunize mice, at 1 microgram/ml for 2 hours at 37 °C. Wells were then aspirated and blocked with phosphate buffered saline containing 1% (w/v) BSA for 2 hours at room temperature, and subsequently washed in PBS containing 0.1% Tween 20 (PBST). Purified antibody 10E3-G4-D3 was added at 2 fold dilutions (1000 ng - 16 ng) in PBST and incubated for 30 minutes at room temperature. This was followed by washing 6 times with PBST and subsequently incubating with HRP-conjugated donkey anti-mouse IgG (H+L)Affinipure F(ab') fragment (Jackson Immunoresearch, West Grove, PA) at 1:20000 for 30 minutes. Plates were then washed and incubated for 15 minutes in tetramethyl benzidine. Reactions were stopped by the addition of 1N sulfuric acid and plates were read at 450 nm using an ELISA plate reader. As shown in Fig. 8, reactivity was seen with the peptide of SEQ ID NO: 496 (corresponding to amino acids 439-459 of P501S) and with the P501S fragment but not with the remaining peptides, demonstrating that the epitope recognized by 10E3-G4-D3 is localized to amino acids 439-459 of SEQ ID NO: 113.

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In order to further evaluate the tissue specificity of P501S, multi-array immunohistochemical analysis was performed on approximately 4700 different human tissues encompassing all the major normal organs as well as neoplasias derived from these tissues. Sixty-five of these human tissue samples were of prostate origin. Tissue sections 0.6 mm in diameter were formalin-fixed and paraffin embedded. Samples were pretreated with HIER using 10 mM citrate buffer pH 6.0 and boiling for 10 min. Sections were stained with 10E3-G4-D3 and P501S immunoreactivity was visualized with HRP. All the 65 prostate tissues samples (5 normal, 55 untreated prostate tumors, 5 hormone refractory prostate tumors) were positive, showing distinct perinuclear staining. All other tissues examined were negative for P501S expression.

30 b) Preparation and Characterization of Antibodies against P503S

A fragment of P503S (amino acids 113-241 of SEQ ID NO: 114) was expressed and purified from bacteria essentially as described above for P501S and used to immunize both rabbits

and mice. Mouse monoclonal antibodies were isolated using standard hybridoma technology as described above. Rabbit monoclonal antibodies were isolated using Selected Lymphocyte Antibody Method (SLAM) technology at Immgenics Pharmaceuticals (Vancouver, BC, Canada). Table VI, below, lists the monoclonal antibodies that were developed against P503S.

Table VI

Antibody	Species
20D4	Rabbit
JA1	Rabbit
1A4	Mouse
1C3	Mouse
1C9	Mouse
1D12	Mouse
2A11	Mouse
2H9	Mouse
4H7	Mouse
8A8	Mouse
8D10	Mouse
9C12	Mouse
6D12	Mouse

The DNA sequences encoding the complementarity determining regions (CDRs) for the rabbit monoclonal antibodies 20D4 and JA1 were determined and are provided in SEQ ID NO: 502 and 503, respectively.

In order to better define the epitope binding region of each of the antibodies, a series of overlapping peptides were generated that span amino acids 109-213 of SEQ ID NO: 114. These peptides were used to epitope map the anti-P503S monoclonal antibodies by ELISA as follows. The recombinant fragment of P503S that was employed as the immunogen was used as a positive control. Ninety-six well microtiter plates were coated with either peptide or recombinant antigen at 20 ng/well overnight at 4 °C. Plates were aspirated and blocked with phosphate buffered saline containing 1% (w/v) BSA for 2 hours at room temperature then washed in PBS containing 0.1% Tween 20 (PBST). Purified rabbit monoclonal antibodies diluted in PBST were added to the wells and incubated for 30 min at room temperature. This was followed by washing 6 times with PBST and incubation with Protein-A HRP conjugate at a 1:2000 dilution for a further 30 min. Plates were washed six times in PBST and incubated with tetramethylbenzidine (TMB) substrate for a further

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15 min. The reaction was stopped by the addition of 1N sulfuric acid and plates were read at 450 nm using at ELISA plate reader. ELISA with the mouse monoclonal antibodies was performed with supernatants from tissue culture run neat in the assay.

All of the antibodies bound to the recombinant P503S fragment, with the exception of the negative control SP2 supernatant. 20D4, JA1 and 1D12 bound strictly to peptide #2101 (SEQ ID NO: 504), which corresponds to amino acids 151-169 of SEQ ID NO: 114. 1C3 bound to peptide #2102 (SEQ ID NO: 505), which corresponds to amino acids 165-184 of SEQ ID NO: 114. 9C12 bound to peptide #2099 (SEQ ID NO: 522), which corresponds to amino acids 120-139 of SEQ ID NO: 114. The other antibodies bind to regions that were not examined in these studies.

Subsequent to epitope mapping, the antibodies were tested by FACS analysis on a cell line that stably expressed P503S to confirm that the antibodies bind to cell surface epitopes. Cells stably transfected with a control plasmid were employed as a negative control. Cells were stained live with no fixative. 0.5 ug of anti-P503S monoclonal antibody was added and cells were incubated on ice for 30 min before being washed twice and incubated with a FITC-labelled goat anti-rabbit or mouse secondary antibody for 20 min. After being washed twice, cells were analyzed with an Excalibur fluorescent activated cell sorter. The monoclonal antibodies 1C3, 1D12, 9C12, 20D4 and JA1, but not 8D3, were found to bind to a cell surface epitope of P503S.

In order to determine which tissues express P503S, immunohistochemical analysis was performed, essentially as described above, on a panel of normal tissues (prostate, adrenal, breast, cervix, colon, duodenum, gall bladder, ileum, kidney, ovary, pancreas, parotid gland, skeletal muscle, spleen and testis). HRP-labeled anti-mouse or anti-rabbit antibody followed by incubation with TMB was used to visualize P503S immunoreactivity. P503S was found to be highly expressed in prostate tissue, with lower levels of expression being observed in cervix, colon, ileum and kidney, and no expression being observed in adrenal, breast, duodenum, gall bladder, ovary, pancreas, parotid gland, skeletal muscle, spleen and testis.

Western blot analysis was used to characterize anti-P503S monoclonal antibody specificity. SDS-PAGE was performed on recombinant (rec) P503S expressed in and purified from bacteria and on lysates from HEK293 cells transfected with full length P503S. Protein was transferred to nitrocellulose and then Western blotted with each of the anti-P503S monoclonal antibodies (20D4, JA1, 1D12, 6D12 and 9C12) at an antibody concentration of 1 ug/ml. Protein was detected using horse radish peroxidase (HRP) conjugated to either a goat anti-mouse monoclonal antibody or to protein A-sepharose. The monoclonal antibody 20D4 detected the

appropriate molecular weight 14 kDa recombinant P503S (amino acids 113-241) and the 23.5 kDa species in the HEK293 cell lysates transfected with full length P503S. Other anti-P503S monoclonal antibodies displayed similar specificity by Western blot.

c) Preparation and Characterization of Antibodies against P703P

Rabbits were immunized with either a truncated (P703Ptr1; SEQ ID NO: 172) or full-length mature form (P703Pfl; SEQ ID NO: 523) of recombinant P703P protein was expressed in and purified from bacteria as described above. Affinity purified polyclonal antibody was generated using immunogen P703Pfl or P703Ptr1 attached to a solid support. Rabbit monoclonal antibodies were isolated using SLAM technology at Immgenics Pharmaceuticals. Table VII below lists both the polyclonal and monoclonal antibodies that were generated against P703P.

Table VII

Antibody	Immunogen	Species/type
Aff. Purif. P703P (truncated); #2594	P703Ptrl	Rabbit polyclonal
Aff. Purif. P703P (full length); #9245	P703Pfl	Rabbit polyclonal
2D4	P703Ptrl	Rabbit monoclonal
8H2	P703Ptrl	Rabbit monoclonal
7H8	P703Ptrl	Rabbit monoclonal

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The DNA sequences encoding the complementarity determining regions (CDRs) for the rabbit monoclonal antibodies 8H2, 7H8 and 2D4 were determined and are provided in SEQ ID NO: 506-508, respectively.

Epitope mapping studies were performed as described above. Monoclonal antibodies 2D4 and 7H8 were found to specifically bind to the peptides of SEQ ID NO: 509 (corresponding to amino acids 145-159 of SEQ ID NO: 172) and SEQ ID NO: 510 (corresponding to amino acids 11-25 of SEQ ID NO: 172), respectively. The polyclonal antibody 2594 was found to bind to the peptides of SEQ ID NO: 511-514, with the polyclonal antibody 9427 binding to the peptides of SEQ ID NO: 515-517.

The specificity of the anti-P703P antibodies was determined by Western blot analysis as follows. SDS-PAGE was performed on (1) bacterially expressed recombinant antigen; (2) lysates of HEK293 cells and Ltk-/- cells either untransfected or transfected with a plasmid

expressing full length P703P; and (3) supernatant isolated from these cell cultures. Protein was transferred to nitrocellulose and then Western blotted using the anti-P703P polyclonal antibody #2594 at an antibody concentration of 1 ug/ml. Protein was detected using horse radish peroxidase (HRP) conjugated to an anti-rabbit antibody. A 35 kDa immunoreactive band could be observed with recombinant P703P. Recombinant P703P runs at a slightly higher molecular weight since it is epitope tagged. In lysates and supernatants from cells transfected with full length P703P, a 30 kDa band corresponding to P703P was observed. To assure specificity, lysates from HEK293 cells stably transfected with a control plasmid were also tested and were negative for P703P expression. Other anti-P703P antibodies showed similar results.

Immunohistochemical studies were performed as described above, using anti-P703P monoclonal antibody. P703P was found to be expressed at high levels in normal prostate and prostate tumor tissue but was not detectable in all other tissues tested (breast tumor, lung tumor and normal kidney).

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EXAMPLE 19

CHARACTERIZATION OF CELL SURFACE EXPRESSION AND CHROMOSOME LOCALIZATION OF THE PROSTATE-SPECIFIC ANTIGEN P501S

This example describes studies demonstrating that the prostate-specific antigen P501S is expressed on the surface of cells, together with studies to determine the probable chromosomal location of P501S.

The protein P501S (SEQ ID NO: 113) is predicted to have 11 transmembrane domains. Based on the discovery that the epitope recognized by the anti-P501S monoclonal antibody 10E3-G4-D3 (described above in Example 17) is intracellular, it was predicted that following transmembrane determinants would allow the prediction of extracellular domains of P501S. Fig. 9 is a schematic representation of the P501S protein showing the predicted location of the transmembrane domains and the intracellular epitope described in Example 17. Underlined sequence represents the predicted transmembrane domains, bold sequence represents the predicted extracellular domains, and italized sequence represents the predicted intracellular domains. Sequence that is both bold and underlined represents sequence employed to generate polyclonal rabbit serum. The location of the transmembrane domains was predicted using HHMTOP as

described by Tusnady and Simon (Principles Governing Amino Acid Composition of Integral Membrane Proteins: Applications to Topology Prediction, J. Mol. Biol. 283:489-506, 1998).

Based on Fig. 9, the P501S domain flanked by the transmembrane domains corresponding to amino acids 274-295 and 323-342 is predicted to be extracellular. The peptide of SEQ ID NO: 518 corresponds to amino acids 306-320 of P501S and lies in the predicted extracellular domain. The peptide of SEQ ID NO: 519, which is identical to the peptide of SEQ ID NO: 518 with the exception of the substitution of the histidine with an asparginine, was synthesized as described above. A Cys-Gly was added to the C-terminus of the peptide to facilitate conjugation to the carrier protein. Cleavage of the peptide from the solid support was carried out using the following cleavage mixture: trifluoroacetic acid:ethanediol:thioanisol:water:phenol (40:1:2:2:3). After cleaving for two hours, the peptide was precipitated in cold ether. The peptide pellet was then dissolved in 10% v/v acetic acid and lyophilized prior to purification by C18 reverse phase hplc. A gradient of 5-60% acetonitrile (containing 0.05% TFA) in water (containing 0.05% TFA) was used to elute the peptide. The purity of the peptide was verified by hplc and mass spectrometry, and was determined to be >95%. The purified peptide was used to generate rabbit polyclonal antisera as described above.

Surface expression of P501S was examined by FACS analysis. Cells were stained with the polyclonal anti-P501S peptide serum at 10 µg/ml, washed, incubated with a secondary FITC-conjugated goat anti-rabbit Ig antibody (ICN), washed and analyzed for FITC fluorescence using an Excalibur fluorescence activated cell sorter. For FACS analysis of transduced cells, B-LCL were retrovirally transduced with P501S. To demonstrate specificity in these assays, B-LCL transduced with an irrelevant antigen (P703P) or nontransduced were stained in parallel. For FACS analysis of prostate tumor cell lines, Lncap, PC-3 and DU-145 were utilized. Prostate tumor cell lines were dissociated from tissue culture plates using cell dissociation medium and stained as above. All samples were treated with propidium iodide (PI) prior to FACS analysis, and data was obtained from PI-excluding (i.e. intact and non-permeabilized) cells. The rabbit polyclonal serum generated against the peptide of SEQ ID NO: 519 was shown to specifically recognize the surface of cells transduced to express P501S, demonstrating that the epitope recognized by the polyclonal serum is extracellular.

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To determine biochemically if P501S is expressed on the cell surface, peripheral membranes from Lncap cells were isolated and subjected to Western blot analysis. Specifically, Lncap cells were lysed using a dounce homogenizer in 5 ml of homogenization buffer (250 mM)

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sucrose, 10 mM HEPES, 1mM EDTA, pH 8.0, 1 complete protease inhibitor tablet (Boehringer Mannheim)). Lysate samples were spun at 1000 g for 5 min at 4 °C. The supernatant was then spun at 8000g for 10 min at 4 °C. Supernatant from the 8000g spin was recovered and subjected to a 100,000g spin for 30 min at 4 °C to recover peripheral membrane. Samples were then separated by SDS-PAGE and Western blotted with the mouse monoclonal antibody 10E3-G4-D3 (described above in Example 17) using conditions described above. Recombinant purified P501S, as well as HEK293 cells transfected with and over-expressing P501S were included as positive controls for P501S detection. LCL cell lysate was included as a negative control. P501S could be detected in Lncap total cell lysate, the 8000g (internal membrane) fraction and also in the 100,000g (plasma membrane) fraction. These results indicate that P501S is expressed at, and localizes to, the peripheral membrane.

To demonstrate that the rabbit polyclonal antiserum generated to the peptide of SEO ID NO: 519 specifically recognizes this peptide as well as the corresponding native peptide of SEO ID NO: 518, ELISA analyses were performed. For these analyses, flat-bottomed 96 well microtiter plates were coated with either the peptide of SEQ ID NO: 519, the longer peptide of SEO ID NO: 520 that spans the entire predicted extracellular domain, the peptide of SEQ ID NO: 521 which represents the epitope recognized by the P501S-specific antibody 10E3-G4-D3, or a P501S fragment (corresponding to amino acids 355-526 of SEQ ID NO: 113) that does not include the immunizing peptide sequence, at 1 µg/ml for 2 hours at 37 °C. Wells were aspirated, blocked with phosphate buffered saline containing 1% (w/v) BSA for 2 hours at room temperature and subsequently washed in PBS containing 0.1% Tween 20 (PBST). Purified anti-P501S polyclonal rabbit serum was added at 2 fold dilutions (1000 ng - 125 ng) in PBST and incubated for 30 min at room temperature. This was followed by washing 6 times with PBST and incubating with HRPconjugated goat anti-rabbit IgG (H+L) Affinipure F(ab') fragment at 1:20000 for 30 min. Plates were then washed and incubated for 15 min in tetramethyl benzidine. Reactions were stopped by the addition of 1N sulfuric acid and plates were read at 450 nm using an ELISA plate reader. As shown in Fig. 11, the anti-P501S polyclonal rabbit serum specifically recognized the peptide of SEQ ID NO: 519 used in the immunization as well as the longer peptide of SEQ ID NO: 520, but did not recognize the irrelevant P501S-derived peptides and fragments.

In further studies, rabbits were immunized with peptides derived from the P501S sequence and predicted to be either extracellular or intracellular, as shown in Fig. 9. Polyclonal rabbit sera were isolated and polyclonal antibodies in the serum were purified, as described above.

To determine specific reactivity with P501S, FACS analysis was employed, utilizing either B-LCL transduced with P501S or the irrelevant antigen P703P, of B-LCL infected with vaccinia virus-expressing P501S. For surface expression, dead and non-intact cells were excluded from the analysis as described above. For intracellular staining, cells were fixed and permeabilized as described above. Rabbit polyclonal serum generated against the peptide of SEQ ID NO: 548, which corresponds to amino acids 181-198 of P501S, was found to recognize a surface epitope of P501S. Rabbit polyclonal serum generated against the peptide SEQ ID NO: 551, which corresponds to amino acids 543-553 of P501S, was found to recognize an epitope that was either potentially extracellular or intracellular since in different experiments intact or permeabilized cells were recognized by the polyclonal sera. Based on similar deductive reasoning, the sequences of SEQ ID NO: 541-547, 549 and 550, which correspond to amino acids 109-122, 539-553, 509-520, 37-54, 342-359, 295-323, 217-274, 143-160 and 75-88, respectively, of P501S, can be considered to be potential surface epitopes of P501S recognized by antibodies.

Radiation Hybrid panel (Research Genetics). The PCR primers of SEQ ID NO: 528 and 529 were employed in PCR with DNA pools from the hybrid panel according to the manufacturer's directions. After 38 cycles of amplification, the reaction products were separated on a 1.2% agarose gel, and the results were analyzed through the Whitehead Institute/MIT Center for Genome Research web server (http://www-genome.wi.mit.edu/cgi-bin/contig/rhmapper.pl) to determine the probable chromosomal location. Using this approach, P501S was mapped to the long arm of chromosome 1 at WI-9641 between q32 and q42. This region of chromosome 1 has been linked to prostate cancer susceptibility in hereditary prostate cancer (Smith et al. Science 274:1371-1374, 1996 and Berthon et al. Am. J. Hum. Genet. 62:1416-1424, 1998). These results suggest that P501S may play a role in prostate cancer malignancy.

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From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the present invention is not limited except as by the appended claims.

CLAIMS

- 1. An isolated polypeptide comprising at least an immunogenic portion of a prostate-specific protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:
- (a) sequences recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536;
- (b) sequences that hybridize to any of the foregoing sequences under moderately stringent conditions; and
 - (c) complements of any of the sequence of (a) or (b).
- 2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID No: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotide sequences.
- 3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 108, 112, 113, 114, 172, 176, 178, 327, 329, 331, 339, 383, 477-483, 496, 504, 505, 519, 520, 522, 525, 527, 532, 534 and 537-550.

- 4. An isolated polynucleotide encoding at least 15 contiguous amino acid residues of a prostate-specific protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing sequences.
- 5. An isolated polynucleotide encoding a prostate-specific protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing sequences.
- 6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536.

- 7. An isolated polynucleotide comprising a sequence that hybridizes under moderately stringent conditions to a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536.
- 8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.
 - 9. An expression vector comprising a polynucleotide according to any one of claims 4-8.

10. A host cell transformed or transfected with an expression vector according to claim 9.

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11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a prostate-specific protein, the protein comprising an amino acid sequence encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536 or a complement of any of the foregoing polynucleotide sequences.

12. A monoclonal antibody that specifically binds to an amino acid sequence selected from the group consisting of SEQ ID NO: 496, 504, 505, 509-517, 519, 520, 522 and 539-551.

- 13. A monoclonal antibody comprising a complementarity determining region selected from the group consisting of SEQ ID NO: 502, 503 and 506-508.
- 14. A fusion protein comprising at least one polypeptide according to 10 claim 1.
 - 15. A fusion protein according to claim 14, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

16. A fusion protein according to claim 14, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

- 17. A fusion protein according to claim 14, wherein the fusion protein comprises an affinity tag.
 - 18. An isolated polynucleotide encoding a fusion protein according to claim 14.
- 25 19.. A pharmaceutical composition comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:
 - (a) a polypeptide according to claim 1;
 - (b) a polynucleotide according to claim 4;
 - (c) an antibody according to any one of claims 11-13;
 - (d) a fusion protein according to claim 14; and

- (e) a polynucleotide according to claim 18.
- 20. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:
 - (a) a polypeptide according to claim 1;
 - (b) a polynucleotide according to claim 4;
 - (c) an antibody according to any one of claims 11-13;
 - (d) a fusion protein according to claim 14; and
 - (e) a polynucleotide according to claim 18.

- 21. A vaccine according to claim 20, wherein the immunostimulant is an adjuvant.
- 22. A vaccine according to claim 20, wherein the immunostimulant induces a predominantly Type I response.
 - 23. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 19.

- 24. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 20.
- 25. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.
 - 26. A pharmaceutical composition according to claim 25, wherein the antigen presenting cell is a dendritic cell or a macrophage.

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- 27. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.
- 28. A vaccine according to claim 27, wherein the immunostimulant is an adjuvant.
 - 29. A vaccine according to claim 27, wherein the immunostimulant induces a predominantly Type I response.
- 30. A vaccine according to claim 27, wherein the antigen-presenting cell is a dendritic cell.
- 31. A method for inhibiting the development of a cancer-in-a-patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide encoded by a polynucleotide recited in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, and thereby inhibiting the development of a cancer in the patient.
 - 32. A method according to claim 31, wherein the antigen-presenting cell is a dendritic cell.
- 33. A method according to any one of claims 23, 24 and 31, wherein the cancer is prostate cancer.
 - 34. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- 39. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 38.
- 5 40. A method for inhibiting the development of a cancer in a patient, comprising the steps of:
 - (a) incubating CD4⁺ and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of:
 - (i) a polypeptide according to claim 1;
 - (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536;
 - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); or
 - (iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

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- 41. A method for inhibiting the development of a cancer in a patient, comprising the steps of:
- (a) incubating CD4⁺ and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536;
 - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); or

- (i) polynucleotides recited in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536; and
 - (ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the prostate-specific protein from the sample.

- 35. A method according to claim 34, wherein the biological sample is blood or a fraction thereof.
 - 36. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

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- 37. A method for stimulating and/or expanding T cells specific for a prostate-specific protein, comprising contacting T cells with at least one component selected from the group consisting of:
 - (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536;
 - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii), under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.
- 38. An isolated T cell population, comprising T cells prepared according to the method of claim 37.

(iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate;

- (b) cloning at least one proliferated cell to provide cloned T cells; and
- (c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.
- 42. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:
- (a) contacting a biological sample obtained from a patient with a binding agent that binds to a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:
- (i) polynucleotides recited in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536; and
 - (ii) complements of the foregoing polynucleotides;
 - (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and
- 20 (c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.
 - 43. A method according to claim 42, wherein the binding agent is an antibody.
 - 44. A method according to claim 43, wherein the antibody is a monoclonal antibody.
- 45. A method according to claim 42, wherein the cancer is prostate 30 cancer.

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46. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

- (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides;
- 10 (b) detecting in the sample an amount of polypeptide that binds to the binding agent;
 - (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
- (d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.
 - 47. A method according to claim 46, wherein the binding agent is an antibody.
 - 48. A method according to claim 47, wherein the antibody is a monoclonal antibody.
- 49. A method according to claim 46, wherein the cancer is a prostate cancer.
 - 50. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:
- (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein,

wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides;

- (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and
- (c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

- 51. A method according to claim 50, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.
- 52. A method according to claim 50, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.
- 53. A method for monitoring the progression of a cancer in a patient, comprising the steps of:
 - (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides;
 - (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;
- (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

- (d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.
- 54. A method according to claim 53, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.
- 55. A method according to claim 53, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.
 - 56. A diagnostic kit, comprising:
 - (a) one or more antibodies according to claim 11; and
 - (b) a detection reagent comprising a reporter group.
 - 57. A kit according to claim 56, wherein the antibodies are immobilized on a solid support.
- 20 58. A kit according to claim 56, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.
 - 59. A kit according to claim 56, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.
 - 60. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45,

47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides.

61. A oligonucleotide according to claim 60, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-476, 524, 526, 530, 531, 533, 535 and 536.

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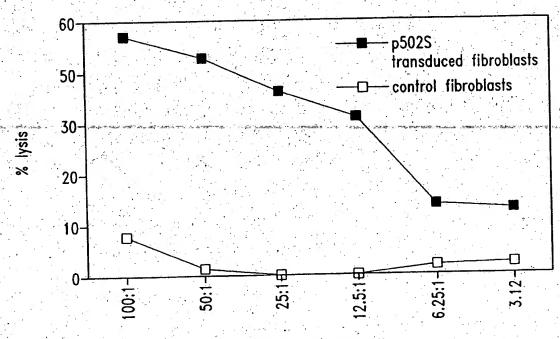
- 62. A diagnostic kit, comprising:
- (a) an oligonucleotide according to claim 61; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

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- 63. A host cell according to claim 10, wherein the cell is selected from the group consisting of: *E. coli*, baculovirus and mammalian cells.
 - 64. A recombinant protein produced by a host cell according to claim

25 10.

WO 01/34802 PCT/US00/30904



Effector: Target Ratio

Fig. 1

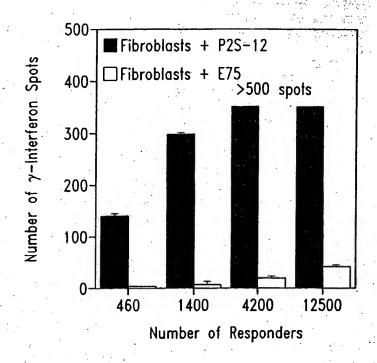


Fig. 2A

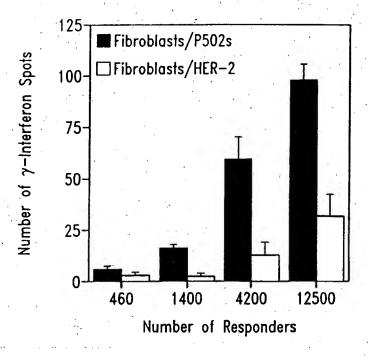
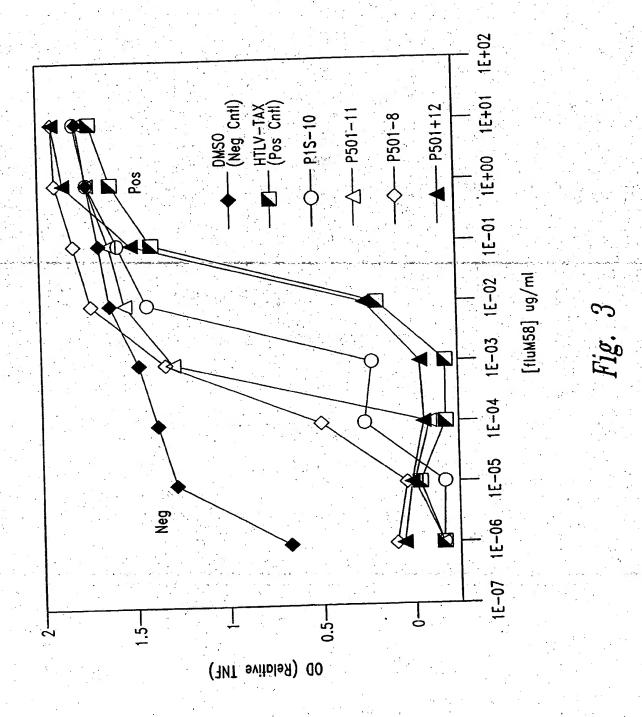


Fig. 2B



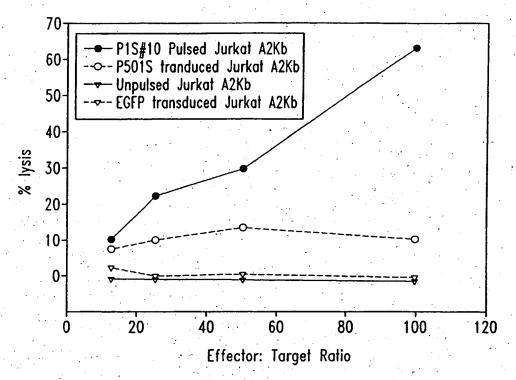


Fig. 4

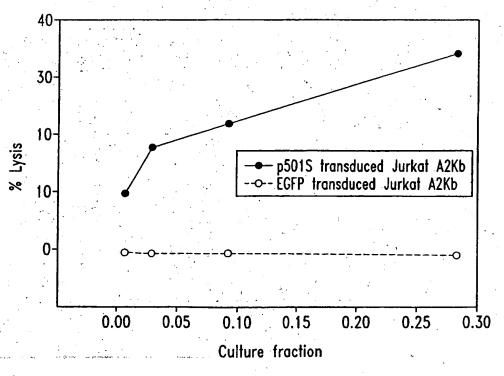


Fig. 5

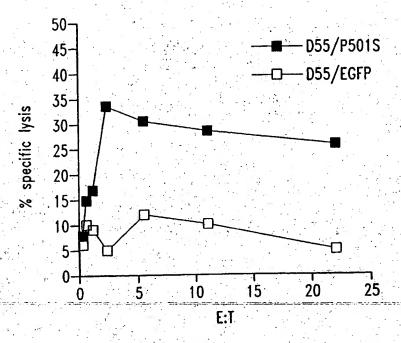


Fig. 6A

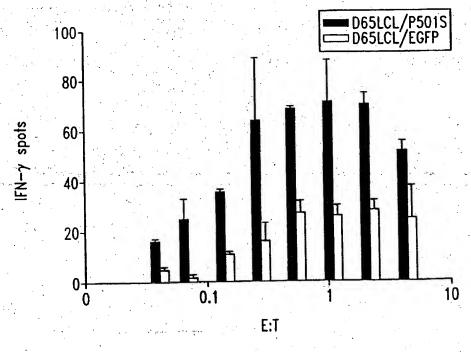
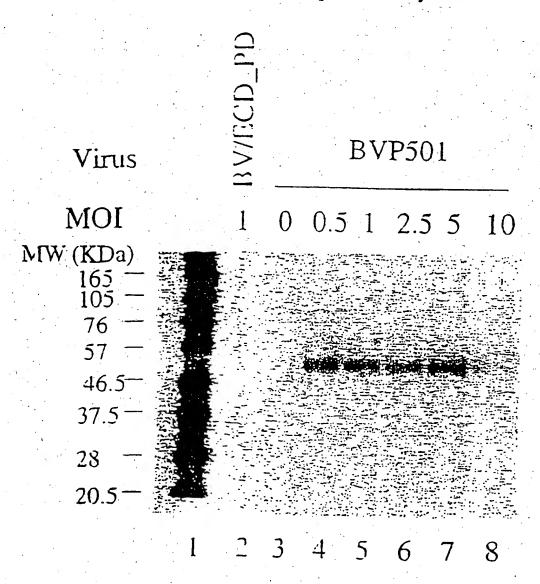


Fig. 6B

Expression of P501S by the Baculovirus Expression System



0.6 million high 5 rells in 5-well plate were infected with an unrelated control virus BV/ECD_PD (lane 1, without virus (lane 3), or with recombinant baculovirus for P501 at different NOIs (lane 4 - 8). Cell lysates were run on SDS-PAGE under the reducing conditions and analyzed by Western blot with a monoclonal analyzed against 75 1.8 F5018-10E3-G4D3). Lane 1 is the biotinylated protein molecular weight marker. Stollabs).

Fig. 7

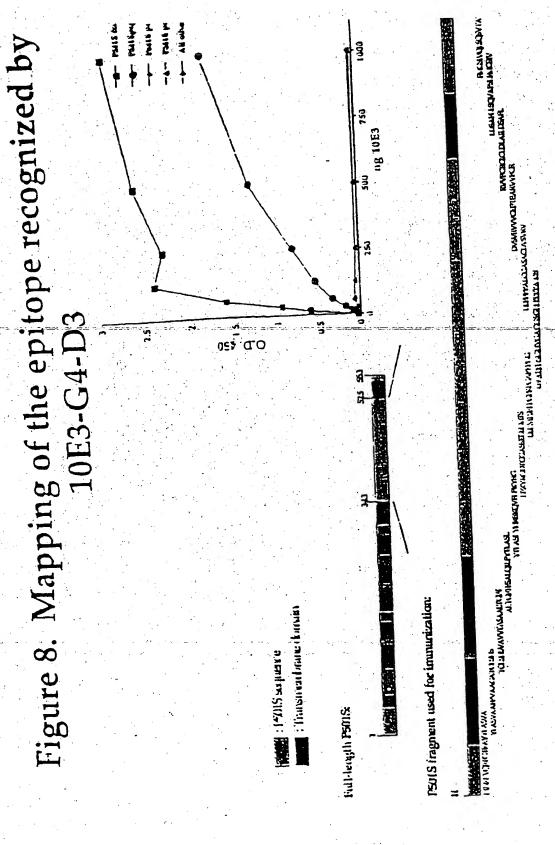


Fig. 8

Schematic of P501S with predicted transmembrane, cytoplasmic, and extracellular regions

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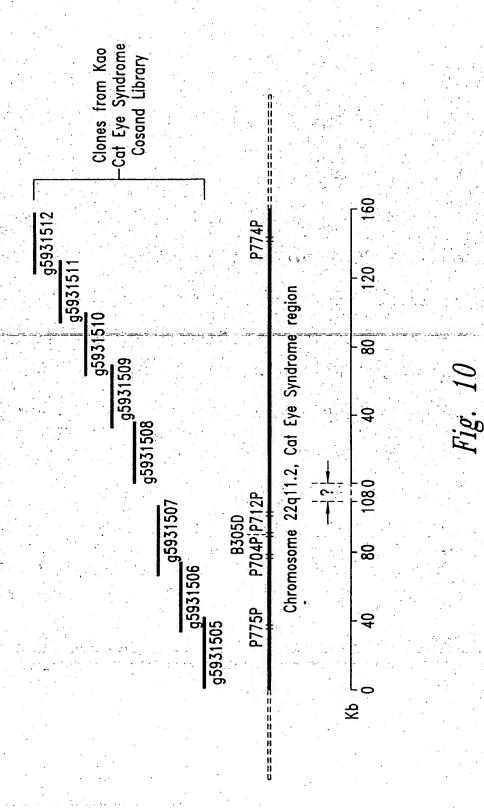
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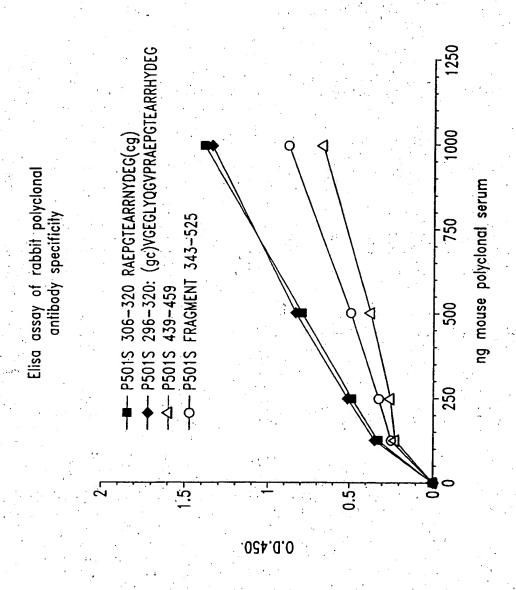
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<u>Underlined sequence</u>: Predicted transmembrane domain; **Bold sequence**: Predicted extracellular domain; *Italic sequence*: Predicted intracellular domain. Sequence in bold/underlined: used generate polyclonal rabbit serum

Localization of domains predicted using HMMTOP (G.E. Tusnady an I. Simon (1998) Principles Governing Amino Acid Composition of Integral Membrane Proteins: Applications to topology Prediction. J. Mol Biol. 283, 489-506.

Fig. 9





10/10

780

814

SEQUENCE LISTING

<110> Corixa Corporation Xu, Jiangchun Dillon, Davin C. Mitcham, Jennifer L. Harlocker, Susan Louise Jiang Yuqui Reed, Steven G. Kalos, Michael Fanger, Gary Retter, Mark Solk, John Day, Craig Skeiky, Yasir A.W. Wang, Aijun <120> COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF PROSTATE CANCER <130> 210121.42720PC <140> PCT <141> 2000-11-09 <160> 551 <170> FastSEQ for Windows Version 3.0 <210> 1 <211> 814 <212> DNA <213> Homo sapien <220> <221> misc_feature <222> (1)...(814) <223> n = A, T, C or G<400> 1 ttttttttt ttttcacag tataacagct ctttattct gtgagttcta ctaggaaatc 60 atcaaatctg agggttgtct ggaggacttc aatacacctc cccccatagt gaatcagctt 120 ccagggggtc cagtecetet cettaettea tecceatece atgecaaagg aagacetee 180 cteettgget cacageette tetaggette ceagtgeete caggacagag tgggttatgt 240 tttcagctcc atccttgctg tgagtgtctg gtgcgttgtg cctccagctt ctgctcagtg 300 cttcatggac agtgtccagc acatgtcact ctccactctc tcagtgtgga tccactagtt 360 ctagagegge egecacegeg gtggagetee agettttgtt eeetttagtg agggttaatt 420 gcgcgcttgg cgtaatcatg gtcataactg tttcctgtgt gaaattgtta tccgctcaca 480 attccacaca acatacgage eggaageata aagtgtaaag eetggggtge etaatgagtg 540 anctaactca cattaattgc gttgcgctca ctgnccgctt tccagtcngg aaaactgtcg 600 tgccagctgc attaatgaat cggccaacgc ncggggaaaa gcggtttgcg ttttgggggc 660 tetteegett etegeteact nanteetgeg eteggtentt eggetgeggg gaacggtate

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gtactactcg attgtcaacg tcaaggagtc gcaggtcgcc tggttctagg aataatgggg
                                                                        360
gaagtatgta ggaattgaag attaatcege egtagteggt gtteteetag gtteaatace
                                                                        420
attggtggcc aattgatttg atggtaaggg gagggatcgt tgaactcgtc tgttatgtaa
                                                                        480
aggatneett ngggatggga aggenatnaa ggaetangga tnaatggegg geangatatt
                                                                        540
traaacngte tetantteet gaaacgtetg aaatgttaat aanaattaan tttngttatt
                                                                        600.
gaatnttnng gaaaagggct tacaggacta gaaaccaaat angaaaanta atnntaangg
                                                                        660
enttatentn aaaggtnata aceneteeta tnateeeace caatngnatt eeceaenenn
                                                                        720
acnattggat nececantte canaaangge enceceegg tgnanneene ettttgttee
                                                                        780
cttnantgan ggttattene ceetngentt atcance
                                                                        817
      <210> 8
      <211> 799
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(799)
      <223> n = A,T,C or G
      <400> 8
catttccggg tttactttct aaggaaagcc gagcggaagc tgctaacgtg ggaatcggtg
                                                                        60
cataaggaga actttctgct ggcacgcgct agggacaagc gggagagcga ctccgagcqt
                                                                       120
ctgaagcgca cgtcccagaa ggtggacttg gcactgaaac agctgggaca catccgcgag
                                                                       180
tacgaacage geetgaaagt getggagegg gaggteeage agtgtageeg egteetgggg
                                                                       240
tgggtggceg angectgane egetetgeet tgetgeeece angtgggeeg ceaececetg
                                                                       300
acctgcctgg gtccaaacac tgagccctgc tggcggactt caagganaac ccccacangg
                                                                       360
ggattttget cetanantaa ggeteatetg ggeeteggee eeeceacetg gttggeettg
                                                                       420
tetttgangt gageeceatg tecatetggg ceaetgteng gaeeacettt ngggagtgtt
                                                                       480
ctccttacaa ccacannatg cccggctcct cccggaaacc anteccance tgngaaggat
                                                                       540
caagneetgn atceactnnt netanaaceg geenceneeg engtggaace encettntgt.
                                                                       600
```

teettttent tnagggttaa tnnegeettg geettneean ngteetnene ntttteennt

```
gttnaaattg ttangeneee neennteeen ennennenan eeegaeeenn annttnnann
                                                                         720
 nectgggggt necnnengat tgaccennec necetntant tgenttnggg nnenntgece
                                                                         780
 ctttccctct nggganncg
                                                                         799
       <210> 9
       <211> 801
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) . . . (801)
       <223> n = A, T, C \text{ or } G
       <400> 9
 acgccttgat cctcccaggc tgggactggt tctgggagga gccgggcatg ctgtggtttg
                                                                         60
taangatgac acteccaaag gtggteetga cagtggeeca gatggacatg gggeteacet
                                                                         120
caaggacaag gccaccaggt gcgggggccg aagcccacat gatccttact ctatgagcaa
                                                                        180
aatcccctgt gggggcttct ccttgaagtc cgccancagg gctcagtctt tggacccang
                                                                        240
caggicatgg ggttgtngnc caactggggg ccncaacgca aaanggcnca gggcctcngn
                                                                        300
cacccatece angaegegge tacactnetg gaecteeene tecaccaett teatgegetg
                                                                        360
ttentaceeg egnatnigte ceancigtti engigeenae tecancitet nggaegigeg
                                                                        420
ctacatacgc_ccggantcnc_nctcccgctt_tgtccctatc_cacgtnccan-caacaaattt
                                                                        480
encentantg cacenattee caenttine agnitteene nnegngette etintaaaag
                                                                        540
ggttganccc cggaaaatnc cccaaagggg gggggccngg tacccaactn ccccctnata
                                                                        600
gctgaantcc ccatnaccnn gnctcnatgg ancentcent tttaannacn ttctnaactt
                                                                        660
gggaanance etegneenth ecceenttaa teceneettg enangment ecceenntee
                                                                        720
necennntng gentntnann enaaaaagge cennnancaa teteetnnen eeteantteg
                                                                       - 780
ccancecteg aaateggeen e
       <210> 10
       <211> 789
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(789)
      \langle 223 \rangle n = A,T,C or G
      <400> 10
cagtetaint ggccagtgtg gcagetttee etgtggetge eggtgecaca tgeetgteee
                                                                         60
acagtgtggc cgtggtgaca gcttcagccg ccctcaccgg gttcaccttc tcagccctgc
                                                                        120
agatectgee ctacacactg geeteectet accaceggga gaageaggtg tteetgeeca
                                                                        180
aataccgagg ggacactgga ggtgctagca gtgaggacag cctgatgacc agcttcctgc
                                                                        240
caggeeetaa geetggaget eeetteeeta atggacaegt gggtgetgga ggeagtggee
                                                                        300
tgctcccacc tccacccgcg ctctgcgggg cctctgcctg tgatgtctcc gtacgtgtgg
                                                                        360
tggtgggtga gcccaccgan gccagggtgg ttccgggccg gggcatctgc ctggacctcg
                                                                        420
ccatcctgga tagtgcttcc tgctgtccca ngtggcccca tccctgttta tgggctccat
                                                                        480
tgtccagctc agccagtctg tcactgccta tatggtgtct gccgcaggcc tgggtctggt
                                                                        540
cccatttact ttgctacaca ggtantattt gacaagaacg anttggccaa atactcagcg
                                                                        600
ttaaaaaatt ccagcaacat tgggggtgga aggcctgcct cactgggtcc aactccccgc
                                                                        660
tcctgttaac cccatggggc tgccggcttg gccgccaatt tctgttgctg ccaaantnat
                                                                        720
gtggetetet getgeeacet gttgetgget gaagtgenta engeneanet nggggggtng
                                                                        780
ggngttccc
                                                                        789
```

<210> 11

<211> 772

<221> misc_feature <222> (1)...(729) <223> n = A,T,C or G

```
<212> DNA
       <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(772)
      <223> n = A, T, C or G
      <400> 11
cccaccetac ccaaatatta gacaccaaca cagaaaaget agcaatggat tecettetac
                                                                         60
tttgttaaat aaataagtta aatatttaaa tgcctgtgtc tctgtgatgg caacagaagg
                                                                        120
accaacaggc cacatcctga taaaaggtaa gaggggggtg gatcagcaaa aagacagtgc
                                                                        180
tgtgggctga ggggacctgg ttcttgtgtg ttgcccctca ggactcttcc cctacaaata
                                                                        240
actiticatat giticaaatcc catggaggag tgiticatcc tagaaactcc catgcaagag
                                                                        300
ctacattaaa cgaagctgca ggttaagggg cttanagatg ggaaaccagg tgactgagtt
                                                                        360
tattcagete ecaaaaaeee ttetetaggt gtgteteaae taggaggeta getgttaaee
                                                                        420
ctgagcctgg gtaatccacc tgcagagtcc ccgcattcca gtgcatggaa cccttctggc
                                                                        480
ctecetgtat aagtecagae tgaaacccce ttggaaggne tecagteagg cageectana
                                                                        540
aactggggaa aaaagaaaag gacgccccan cccccagctg tgcanctacg cacctcaaca
                                                                        600
gcacagggtg gcagcaaaaa aaccacttta ctttggcaca aacaaaaact ngggggggca
                                                                        660
accceggeac ceenangggg gttaacagga anengggnaa entggaacce aattnaggea
                                                                        720
ggcccnccac cccnaatntt gctgggaaat ttttcctccc ctaaattntt tc
                                                                        772
      <210> 12
      <211> 751
      <212> DNA
      <213> Homo sapien
      <220> ---
      <221> misc feature
      <222> (1) . . . (751)
      <223> n = A, T, C or G
      <400> 12
gccccaattc cagetgccac accaeccacg gtgaetgcat tagtteggat gtcatacaaa
                                                                        60
agetgattga ageaaceete taetttttgg tegtgageet tttgettggt geaggtttea
                                                                       120
ttggctgtgt tggtgacgtt gtcattgcaa cagaatgggg gaaaggcact gttctctttg
                                                                       180
aagtanggtg agtcctcaaa atccgtatag ttggtgaagc cacagcactt gagccctttc
                                                                       240
atggtggtgt tecacacttg agtgaagtet teetgggaac cataatettt ettgatggca
                                                                       300
ggcactacca gcaacgtcag ggaagtgctc agccattgtg gtgtacacca aggcgaccac
                                                                       360
agcagctgcn acctcagcaa tgaagatgan gaggangatg aagaagaacg tcncgagggc
                                                                       420
acaettgete teagtettan caccatanea gecentgaaa accaananea aagaecaena
                                                                       480
enceggetge gatgaagaaa tnacceeneg ttgacaaact tgcatggcae tggganccae
                                                                       540
agtggcccna aaaatettca aaaaggatge eecatenatt gaeeeeccaa atgeccaetg
                                                                       600
ccaacagggg ctgccccacn cncnnaacga tganccnatt gnacaagatc tncntggtct
                                                                       660
tnatnaacht gaaccetgen tngtggetee tgtteaggne ennggeetga ettetnaann
                                                                       720
aangaacton gaagnoocca enggananno g
                                                                       751
     <210> 13
     <211> 729
      <212> DNA
     <213> Homo sapien
     <220>
```

```
<400> 13
queccaque tecetetes tecesates grades ecoggagete tritetest
                                                                        60
tgtggancct cagcagtncc ctctttcaga actcantgcc aaganccetg aacaggagce
                                                                       120
accatgoagt gottoagott cattaagaco atgatgatoo tottoaattt gotoatottt
                                                                       180
ctgtgtggtg cagccctgtt ggcagtgggc atctgggtgt caatcgatgg ggcatccttt
                                                                       240
etgaagatet tegggeeaet gtegteeagt geeatgeagt ttgteaaegt gggetaette
                                                                       300
ctcatcgcag ccggcgttgt ggtcttagct ctaggtttcc tgggctgcta tggtgctaag
                                                                       360
actgagagea agtgtgccct cgtgacgttc ttcttcatcc tcctcctcat cttcattgct
                                                                       420
gaggttgcaa tgctgtggtc gccttggtgt acaccacaat ggctgagcac ttcctgacgt
                                                                       480
tgctggtaat gcctgccatc aanaaagat tatgggttcc caggaanact tcactcaagt
                                                                       540
gttggaacac caccatgaaa gggctcaagt gctgtggctt cnnccaacta tacggatttt
                                                                       600
gaaganteac ctacttcaaa gaaaanagtg cettteecce atttetgttg caattgacaa
                                                                       660
acgtccccaa cacagccaat tgaaaacctg cacccaaccc aaangggtcc ccaaccanaa
                                                                       720
                                                                       729
      <210> 14
      <211> 816
      <212> DNA
      <213> Homo sapien
      <220>
     <221> misc feature
     <222> (1) ... (816)
      <223> n = A,T,C or G
      <400> 14
tgctcttcct caaagttgtt cttgttgcca taacaaccac cataggtaaa gcgggcgcag
                                                                        60
tgttegetga aggggttgta gtaccagege gggatgetet cettgeagag teetgtgtet
                                                                       120
ggcaggtcca cgcagtgccc tttgtcactg gggaaatgga tgcgctggag ctcgtcaaag
                                                                       180
ccactcgtgt attiticaca ggcagcctcg tccgacgcgt cggggcagtt gggggtgtct
                                                                       240
teacacteca ggaaactgte natgeageag ceattgetge ageggaactg ggtgggetga
                                                                       300
cangigecag ageacactgg atggegeett tecatgnnan gggeeetgng ggaaagteee
                                                                       360
tganceccan anetgeetet caaangeece acettgeaca eeeegacagg etagaatgga
                                                                       420
atcttcttcc cgaaaggtag tinticitgt tgcccaance ancecentaa acaaactett
                                                                       480
qcanatetqe teegnggggg tentantace anegtgggaa aagaaceeca ggengegaac
                                                                       540
caancttgtt tggatnegaa genataatet netnttetge ttggtggaca geaceantna
                                                                       600
etginnanct tragneening greetening gittgnneting aacetaaten cennicaact
                                                                       660
gggacaaggt aantngcent cetttnaatt ecenanentn eeceetggtt tggggttttn
                                                                       720
                                                                       780
enenetecta ecceagaaan neegtgttee ecceeaacta ggggeenaaa eennttiitte
cacaaccetn ceceacceae gggttengnt ggttng
                                                                       816
      <210> 15
      <211> 783
      <212>"DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) . . . (783)
      \langle 223 \rangle n = A,T,C or G
      <400> 15
                                                                        60
ccaaggcetg ggcaggcata nacttgaagg tacaacccca ggaacccctg gtgctgaagg
atgtggaaaa cacagattgg cgcctactgc ggggtgacac ggatgtcagg gtagagagga
                                                                       120
aagacccaaa ccaggtggaa ctgtggggac tcaaggaang cacctacctg ttccagctga
                                                                       180
cagtgactag ctcaqaccac ccagaggaca cggccaacgt cacagtcact gtgctgtcca
                                                                       240
ccaagcagac agaagactac tgcctcgcat ccaacaangt gggtcgctgc cggggctctt
                                                                       300
teccaegetg gtactatgae eccaeggage agatetgeaa gagtttegtt tatggagget
                                                                       360
```

```
gcttgggcaa caagaacaac taccttcggg aagaagagtg cattctancc/tgtcnqqqtq
                                                                         420
 tgcaaggtgg gcctttgana ngcanctctg gggctcangc gactttcccc cagggcccct
                                                                         480
 ccatggaaag gegecateca ntgttetetg geacetgica geccacecag tteegetgea
                                                                        540
ncaatggctg ctgcatcnac antttcctng aattgtgaca acaccccca ntgcccccaa
                                                                        600
ccctcccaac aaagettccc tgttnaaaaa tacnccantt ggcttttnac aaacncccgq
                                                                        660
cncctcentt ttccccnntn aacaaaggge nctngenttt gaactgeeen aaccenggaa
                                                                        720
tetneenngg aaaaantnee eeceetggtt eetnnaance eeteenenaa anetneecee
                                                                        780
                                                                        783
       <210> 16
       <211> 801
      <212> DNA
      <213> Homo sapien
       <220> ·
      <221> misc_feature
      <222> (1)...(801)
      <223> n = A,T,C or G
      <400> 16
gececaatte cagetgecae accacecaeg gtgactgeat tagtteggat gtcatacaaa
                                                                         60
agetgattga ageaaccete taetttttgg tegtgageet tttgettggt geaggtttea
                                                                        120
ttggctgtgt tggtgacgtt gtcattgcaa cagaatgggg gaaaggcact gttctctttg
                                                                        180
aagtagggtg agteeteaaa ateegtatag ttggtgaage cacageaett gageeettte
                                                                        240
atggtggtgt tecacacttg agtgaagtet teetgggaac cataatettt ettgatggea
                                                                        300
ggcactacca gcaacgtcag gaagtgetca gccattgtgg tgtacaccaa ggcgaccaca
                                                                        360
gcagctgcaa cctcagcaat gaagatgagg aggaggatga agaagaacgt cncgagggca
                                                                        420
caettgetet cegtettage accatageag ceeangaaac caagageaaa gaccacaacg
                                                                        480
cengetgega atgaaagaaa ntacceacgt tgacaaactg catggecact ggacgacagt
                                                                        540
tggcccgaan atcttcagaa aagggatgcc ccatcgattg aacacccana tgcccactgc
                                                                        600
cnacagggct geneenenen gaaagaatga gecattgaag aaggatente ntggtettaa
                                                                        660
tgaactgaaa centgeatgg tggeeeetgt teagggetet tggeagtgaa ttetganaaa
                                                                        720
aaggaacnge ntnageeece eeaaangana aaacaceee gggtgttgee etgaattgge
                                                                        780
ggccaaggan ccctgccccn g
                                                                        801
      <210> 17
      <211> 740
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(740)
      \langle 223 \rangle n = A,T,C or G
      <400> 17
gtgagageca ggegteeete tgeetgeeea eteagtggea aeaeeeggga getgttttgt
                                                                       60
cettigigga geeteageag ticeetetti cagaacteae tgeeaagage eetgaacagg
                                                                       120
agecaccatg cagtgettea getteattaa gaccatgatg atcetettea atttqcteat
                                                                       180
etttetgtgt ggtgeageee tgttggeagt gggeatetgg gtgteaateg atggggeate
                                                                       240
etttetgaag atetteggge caetgtegte eagtgeeatg eagtttgtea aegtgggeta
                                                                       300
ettecteate geageeggeg tigtggtett tgetetiggt ticetggget getaiggige
                                                                       360
taagacggag agcaagtgtg coctogtgac gttottotto atootcotco toatottoat
                                                                       420
tgctgaagtt gcagctgctg tggtcgcctt ggtgtacacc acaatggctg aaccattcct
                                                                       480
gacgttgctg gtantgcctg ccatcaanaa agattatggg ttcccaggaa aaattcactc
                                                                       540
aantntggaa caccnccatg aaaagggete caatttetgn tggetteeee aactataeeg
                                                                       600
gaattttgaa aganteneee taetteeaaa aaaaaanant tgeetttnee eeenttetgt
                                                                       660
```

tgcaatgaaa acntcccaan acngccaatn aaaacctgcc cnnncaaaaa ggntcncaaa

```
740
caaaaaant nnaagggttn
      <210> 18
      <211> 802
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(802)
      <223> n = A,T,C or G
      <400> 18
ccgctggttg cgctggtcca gngnagccac gaagcacgtc agcatacaca gcctcaatca
                                                                      60
caaggtette cagetgeege acattaegea gggeaagage etecageaac actgeatatg
                                                                     120
                                                                     180
ggatacactt tactttagca gccagggtga caactgagag gtgtcgaagc ttattcttct
                                                                     240
gagectetgt tagtggagga agatteeggg etteagetaa gtagteageg tatgteecat
aagcaaacac tgtgagcagc cggaaggtag aggcaaagtc actctcagcc agctctctaa
                                                                     300
cattgggcat gtccagcagt tctccaaaca cgtagacacc agnggcctcc agcacctgat
                                                                     360
ggatgagtgt ggccagcgct gcccccttgg ccgacttggc taggagcaga aattgctcct
                                                                     420
ggttctgccc tgtcaccttc acttccgcac tcatcactgc actgagtgtg ggggacttgg
                                                                     480
                                                                     540
geteaqqatq tecaqaqacq tqqtteegec ceetenetta atgacacegn ccanneaace
660
aancttegte nggeecatgg aatteacene aceggaactn gtangateea etnnttetat
aaccggncgc caccgcnnnt ggaactccac tettnttncc tttacttgag ggttaaggtc
                                                                    720
                                                                     780
accettnineg ttacettggt ccaaacentn centgtgteg anatngtnaa tenggneena
                                                                     802
tnccancene atangaagee ng
      <210> 19
      <211> 731
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (731)
      \langle 223 \rangle n = A,T,C or G
      <400> 19
cnaagettee aggtnaeggg eegenaanee tgaeeenagg tancanaang eagnengegg
                                                                      60
                                                                     120
gagcccaccg tcacgnggng gngtctttat nggaggggc ggagccacat cnctggacnt
cntgacccca actccccncc ncncantgca gtgatgagtg cagaactgaa ggtnacgtgg
                                                                     180
                                                                     240
caqqaaccaa gancaaanne tgeteennte caagteggen nagggggegg ggetggeeae
geneateent enagtgetgn aaageeeenn eetgtetaet tgtttggaga aengennnga
                                                                     300
                                                                     360
catgeceagn gttanataac nggengagag tnantttgee tetecettee ggetgegean
cgngtntgct tagnggacat aacctgacta cttaactgaa cccnngaatc tnccncccct
                                                                     420
ccactaaget cagaacaaaa aacttegaca ccacteantt, gteacetgne tgeteaagta
                                                                     480
                                                                     540
aagtgtacce catneceaat gtntgetnga ngetetgnee tgenttangt teggteetgg
gaagacctat caattnaagc tatgtttctg actgcctctt gctccctgna acaancnacc
                                                                     600
cnnennteca aggggggne ggeececaat ecceccaace ntnaattnan tttaneceen
                                                                     660
ccccenggcc eggcetttta enanentenn nnaengggna aaacennnge tttncccaac
                                                                     720
                                                                     731
nnaatccncc t
      <210> 20
```

<211> 20 <211> 754 <212> DNA

<213> Homo sapien

```
<220>
       <221> misc_feature
       <222> (1)...(754)
       <223> n = A, T, C or G
       <400> 20
ttttttttt tttttttt taaaaacccc ctccattnaa tgnaaacttc cgaaattgtc
                                                                         60
 caacccctc ntccaaatnn conttteegg gngggggttc caaacccaan ttanntttqq
                                                                        120
 annttaaatt aaatnttnnt tggnggnnna anccnaatgt nangaaagtt naacccanta
                                                                        180
 tnancttnaa tncctggaaa cengtngntt ccaaaaatnt ttaaccctta antccctccg
                                                                        240
 aaatngttna nggaaaaccc aanttctcnt aaggttgttt gaaggntnaa tnaaaanccc
                                                                        300
 nnecaattgt ttttngccae geetgaatta attggnttee gntgttttee nttaaaanaa
                                                                        360
 ggnnancece ggttantnaa teeeceenne eecaattata eeganttttt ttngaattgg
                                                                        420
ganccenegg gaattaacgg ggnnnnteec tnttgggggg enggnneece eccenteggg
                                                                        480
ggttngggnc aggnennaat tgtttaaggg tccgaaaaat ccctccnaga aaaaaanctc
                                                                        540
ccaggntgag nntngggttt ncccccccc canggcccct ctcgnanagt tggggtttgg
                                                                        600
ggggcctggg attttntttc ccctnttncc tcccccccc ccnggganag aggttngngt
                                                                        660
tttgntcnnc ggccccnccn aaganctttn ccganttnan ttaaatccnt gcctnggcga
                                                                        720
agtccnttgn agggntaaan ggccccctnn cggg
                                                                        754
       <210> 21
       <211> 755
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(755)
      <223> n = A, T, C or G
      <400>:21
atcaneceat gacceenaac nngggacene teaneeggne nnnenacene eggeenatea
                                                                        60
nngtnagnne actnennttn nateaeneee encenactae geeenenane enaegeneta
                                                                       120
nncanatnce actganngeg egangtngan ngagaaanet nataccanag neaccanaen
                                                                       180
ccagctgtcc nanaangcct nnnatacngg nnnatccaat ntgnancctc cnaagtattn
                                                                       240
nnenneanat gatttteetn aneegattae centnecece taneecetee ecceeaacna
                                                                       300
cgaaggenet ggneenaagg nngegnenee eegetagnte eeenneaagt eneneneeta
                                                                       360 ·
aactcancon nattachege ttentgagta teacteceeg aateteacee tactcaacte
                                                                       420
aaaaanatcn gatacaaaat aatncaagcc tgnttatnac actntgactg ggtctctatt
                                                                       480
ttagnggtcc ntnaanchtc ctaatacttc cagtctncct tcnccaattt ccnaanggct
                                                                       540
ctttcngaca gcatnttttg gttcccnntt gggttcttan ngaattgccc ttcntngaac
                                                                       600
gggctcntct tttccttegg ttancetggn ttcnncegge cagttattat ttcccntttt
                                                                       660
aaattentne entttanttt tggenttena aaceeegge ettgaaaaeg geeeetggt
                                                                       720
aaaaggttgt tttganaaaa tttttgtttt gttcc
                                                                       755
      <210> 22
      <211> 849
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (849)
      \langle 223 \rangle n = A,T,C or G
      <400> 22
ttttttttt tttttangtg tngtcgtgca ggtagaggct tactacaant gtgaanacgt
                                                                        60
```

acgctnggan taangcgacc cganttctag gannencect aaaatcanac tgtgaagatn

```
atcetgnnna eggaanggte aceggnngat nntgetaggg tgneenetee cannnenttn
                                                                       180
cataacteng nggecetgee caccacette ggeggeeeng ngneegggee egggteattn
                                                                       240
gnnttaacen cactnngena neggttteen neecenneng accenggega teeggggtne
                                                                      . 300
tetgtettee eetgnagnen anaaantggg eeneggneee etttaceeet nnacaageea
                                                                       360
engeenteta neenengeee eccetecant nngggggaet geenannget eegttnetng
                                                                       420
nnacccennn gggtnecteg gttgtegant enaccgnang ceanggatte enaaggaagg
                                                                       480
tgegttnttg gecectacce ttegetnegg nneaccette cegacnanga neegeteeeg
                                                                       540
enennegning ectenceteg caacaceege netentengt neggninece ececaceege
                                                                       600
necetenene ngnegnanen eteeneenee gteteannea ecacecegee eegecaggee
                                                                       660
ntcanccaen ggnngacnng nagenennte geneegegen gegneneeet egeenengaa
                                                                       720
ctnentengg ccantnnege teaancenna enaaacgeeg etgegeggee egnagegnee
                                                                       780
necteenega gteeteegn etteenacee anguntteen egaggacaen nnaceeegee
                                                                       840
                                                                       849
nncangcgg
      <210> 23
      <211> 872
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(872)
      <223> n = A, T, C or G
      <400> 23
gegeaaacta tacttegete gnactegtge geetegetne tetttteete egeaaceatg
                                                                        60
tetgacnane eegattngge ngatatenan aagntegane agtecaaact gantaacaca
                                                                       120
cacacnenan aganaaatee netgeettee anagtanaen attgaaenng agaaceange
                                                                       180
nggcgaatcg taatnaggcg tgcgccgcca atntgtcncc gtttattntn ccagcntenc
                                                                       240
ctneenacce taentetten nagetgtenn acceetngtn egnaceeece naggteggga
                                                                       300
tegggtttnn nntgacegng enneceetee eccentecat nacganeene eegcaceace
                                                                       360
nanngenege neceegnnet ettegeenee etgteetntn eeeetgtnge etggenengn
                                                                       420
accgcattga ccctcgccnn ctncnngaaa ncgnanacgt ccgggttgnn annancgctg
                                                                       480
tgggnnngeg tetgeneege gtteetteen nennetteea ceatettent taengggtet
                                                                       540
cenegeente tennneache ectgggaege thteethtge ecceetthae tececeett
                                                                       600
cgncgtgnec cgnccccacc ntcatttnca nacgntette acaannnect ggntnnetee
                                                                       660
cnancngnon gtcanconag ggaagggngg ggnnconntg nttgacgttg nggngangtc
                                                                       . 720
cgaanantee tencentean enctaceeet egggegnnet etengtinee aacttaneaa
                                                                       780
nteteccecy ngngenente teagectene ceneceenet etetgeanty tnetetgete
                                                                        840
                                                                       872
tnaccnntac gantnttcgn cnccctcttt cc
      <210> 24
      <211> 815
       <212> DNA
      <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(815)
       <223> n = A, T, C or G
       <400> 24
gcatgcaagc ttgagtattc tatagngtca cctaaatanc ttggcntaat catggtcnta
                                                                         60
nctgncttcc tgtgtcaaat gtatacnaan tanatatgaa tctnatntga caaganngta
                                                                        120
 tentneatta gtaacaantg tnntgteeat eetgtengan canatteeca tnnattnegn
                                                                        180
 cgcattenen geneantatn taatngggaa ntennntnnn neacenneat etatentnee
                                                                        240
 genecetgae tggnagagat ggatnantte tnntntgace nacatgttea tettggattn
                                                                        300
 aanancecee egengneeae eggttngnng enageennte eeaagaeete etgtggaggt
                                                                        360
```

```
aacctgcgtc aganncatca aacntgggaa acccgcnncc angtnnaagt ngnnncanan
                                                                         420
 gatecegtee aggnttnace atceettene agegeeeet tingtgeett anagngnage
                                                                         480
 gtgtccnanc cnctcaacat ganacgcgcc agnccanccg caattnggca caatgtcgnc
                                                                         540-
 gaacccccta gggggantna tncaaanccc caggattgtc cncncangaa atcccncanc
                                                                         600
 ecencectae cennetttgg gaengtgace aanteeegga gtneeagtee ggeengnete
                                                                         660
 ecceaceggt nncentgggg gggtgaanet engnnteane engnegaggn ntegnaaqqa
                                                                         720
 accggneetn ggnegaanng anenntenga agngeenent egtataacce eccetencea
                                                                         780
nccnacngnt agntccccc engggtnegg aangg
                                                                        815
       <210> 25
       <211> 775
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
      <222> (1) ... (775)
      \langle 223 \rangle n = A,T,C or G
      <400> 25
cegagatgte tegeteegtg geettagetg tgetegeget actetett tetggeetgg
                                                                         60
aggetateca gegtaeteca aagatteagg tttaeteaeg teatecagea gagaatggaa
                                                                        120
agtcaaattt cctgaattgc tatgtgtctg ggtttcatcc atccgacatt gaanttgact
                                                                        180
tactgaagaa tgganagaga attgaaaaag tggagcattc agacttgtct ttcagcaagg
                                                                        240
actggtettt ctatetentg tactacactg aattcacccc cactgaaaaa gatgagtatg
                                                                        300
cctgccgtgt gaaccatgtg actttgtcac agcccaagat agttaagtgg gatcgagaca
                                                                        360
tgtaagcagn cnncatggaa gtttgaagat gccgcatttg gattggatga attccaaatt
                                                                        420
ctgcttgctt gcnttttaat antgatatgc ntatacaccc taccetttat gnccccaaat
                                                                        480
tgtaggggtt acatnantgt tenentngga catgatette etttataant cencentteg
                                                                        540
aattgcccgt enccengttn ngaatgttte ennaaceaeg gttggeteee eeaggtenee
                                                                        600
tettacggaa gggcetggge enetttneaa ggttggggga acenaaaatt tenettntge
                                                                        660
concocneca enntettgng nnencanttt ggaaccette enatteeeet tggeetenna
                                                                        720
nccttnncta anaaaacttn aaancgtngc naaanntttn acttccccc ttacc
                                                                        775
      <210> 26
      <211> 820
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(820)
      \langle 223 \rangle n = A,T,C or G
     <400> 26
anattantac agtgtaatct tttcccagag gtgtgtanag ggaacggggc ctagaggcat
                                                                         60
eccanagata nettatanea acagtgettt gaccaagage tgetgggeae attteetgea
                                                                       120
gaaaaggtgg cggtccccat cactcctcct ctcccatagc catcccagag gggtgagtag
                                                                       180
ccatcangcc ttcggtggga gggagtcang gaaacaacan accacagagc anacagacca
                                                                       240
ntgatgacca tgggcgggag cgagcctctt ccctgnaccg gggtggcana nganagccta
                                                                       300
nctgaggggt cacactataa acgttaacga ccnagatnan cacctgcttc aagtgcaccc
                                                                       360
ttcctacetg acnaceagng acennnaact gengeetggg gacagenetg gganeageta
                                                                       420
acnnageact cacetgeece eccatggeeg tnegenteee tggteetgne aagggaaget
                                                                       480
ccctgttgga attncgggga naccaaggga nccccctcct ccanctgtga aggaaaaann
                                                                       540
gatggaattt tnecetteeg geennteece tetteettta caegeeceet nntactente
                                                                       600
tecetetntt nteetgnene aettttnace cennnattte cettnattga teggannetn
                                                                       660
ganattecae thnegeethe entenateng naanachaaa nacthtetha eeenggggat
                                                                       720
gggnnecteg nteatectet etttttenet acencenntt etttgeetet eettngatea
```

```
820
tecaacente gntggeentn ecceeennn teetttneee
      <210> 27
      <211> 818
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (818)
      \langle 223 \rangle n = A,T,C or G
      <400> 27
tetgggtgat ggeetettee teeteaggga eetetgaetg etetgggeea aagaatetet
                                                                         60
tgtttcttct ccgagcccca ggcagcggtg attcagccct gcccaacctg attctgatga
                                                                        120
ctgcggatgc tgtgacggac ccaaggggca aatagggtcc cagggtccag ggagggggcgc
                                                                        180
ctgctgagca cttccgccc tcaccctgcc cagcccctgc catgagctct gggctgggtc
                                                                        240
teegeeteea gggttetget etteeangea ngecancaag tggegetggg ceacactgge
                                                                        300
ttetteetge ecenteeetg getetgante tetgtettee tgteetgtge angeneettg
                                                                        360
gateteagtt tecetenete anngaactet gtttetgann tetteantta actntgantt
                                                                        420
tatnaccnan tggnetgtne tgtennactt taatgggeen gaceggetaa teceteeete
                                                                        480
nctecettee anttennnna acengettne ententetee centaneceg cengggaane
                                                                       540
ctcctttgcc ctnaccangg gccnnnaccg ccentnictn ggggggenng gtnnctncnc
                                                                        600
etgntnnece enetenennt tnectegtee ennennegen nngeanntte nengteeenn
                                                                        660
tnnetetten ngtntegnaa ngntenentn tnnnnngnen ngntnntnen tecetetene
                                                                        720
conntgnang tonttonnoe nengoneece nonnennon nggonotonn tetnenenge
                                                                        780
                                                                        818
 ccenncece ngnattaagg ceteenntet eeggeene
      <210> 28
       <211> 731
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) . . . (731)
       <223> n = A, T, C or G
       <400> 28
 aggaagggcg gagggatatt gtangggatt gagggatagg agnataangg gggaggtgtg
                                                                          60
 teccaacatg anggtgnngt tetettttga angagggttg ngtttttann eenggtgggt
                                                                         120
 gattnaaccc cattgtatgg agnnaaaggn tttnagggat ttttcggctc ttatcagtat
                                                                         180
 ntanatteet gtnaategga aaatnatntt tennenggaa aatnttgete ceateegnaa
                                                                         240
 attneteceg ggtagtgcat nttngggggn engecangtt teccaggetg ctanaategt
                                                                         300
 actaaagntt naagtgggan tncaaatgaa aacctnncac agagnateen taccegactg
                                                                         360
 tunnttnect tegecetntg actetgenng ageceaatae cenngngnat gtenecengn
                                                                         420
 nnngegnene tgaaannnne tegnggetnn gancateang gggtttegea teaaaagenn
                                                                         480
 egitteneat naaggeactt ingeeteate caaceneing ceetenneca tiingeegie
                                                                         540
 nggttenect aegetnntng enectnnntn ganattttne eegeetnggg naaneeteet
                                                                         600
 gnaatgggta gggnettnte ttttnacenn gnggtntact aatennetne aegentnett
                                                                         660
 tetenacece ecceetttt caateceane ggenaatggg gteteceenn eganggggg
                                                                         720
                                                                         731
 nnncccannc c
       <210> 29
       <211> 822
       <212> DNA
```

<213> Homo sapien

<400> 31

```
<220>
      <221> misc feature
       <222> (1)...(822)
      <223> n = A, T, C or G
      <400> 29
actagtccag tgtggtggaa ttccattgtg ttggggncnc ttctatgant antnttagat
                                                                          60
cgctcanacc tcacancctc ccnacnangc ctataangaa nannaataga nctgtncnnt
                                                                         120
athintache teatanneet ennnaceeae teeetettaa eeentaetgt geetathgen
                                                                         180
tnnetantet ntgeegeetn enanceaeen gtgggeenae enenngnatt etenatetee
                                                                         240
tenecatnin gectananta ngineatace etatacetae necaaigeta nnnetaanen
                                                                         300
tccatnantt annntaacta ccactgacnt ngactttcnc atnanctcct aatttgaatc
                                                                        360
tactctgact cccacngcct annnattage anenteccce nacnatntet caaccaaate
                                                                        420
ntcaacaacc tatctanctg ttenccaacc nttnectecg atcecennac aaccecete
                                                                        480
ccaaataccc nccacctgac ncctaacccn caccatcccg gcaagccnan ggncatttan
                                                                        540
ccactggaat cacnatngga naaaaaaaac ccnaactctc tancncnnat ctccctaana
                                                                        600
aatnoteetn naatttaetn neantneeat caaneecaen tgaaaennaa eecetqtttt
                                                                        660
tanatecett etttegaaaa eenaceettt annneecaae etttngggee eeceenetne
                                                                        720
ccnaatgaag gncncccaat cnangaaacg nccntgaaaa ancnaggcna anannntccg
                                                                        780
canatectat ceettanttn ggggneeett neeengggee ee
                                                                        822
      <210> 30
      <211> 787
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (787)
      \langle 223 \rangle n = A,T,C or G
      <400> 30
cggccgcctg ctctggcaca tgcctcctga atggcatcaa aagtgatgga ctgcccattg
                                                                         60
ctagagaaga ccttctctcc tactgtcatt atggagccct gcagactgag ggctcccctt
                                                                        120
gtctgcagga tttgatgtct gaagtcgtgg agtgtggctt ggagctcctc atctacatna
                                                                        180
getggaagee etggagggee tetetegeea geeteeeet teteteeaeg etetecangg
                                                                        240
acaccagggg ctccaggcag cccattattc ccagnangac atggtgtttc tccacgcgga
                                                                        300
cccatggggc ctgnaaggcc agggtctcct ttgacaccat ctctcccgtc ctgcctggca
                                                                        360
ggccgtggga tccactantt ctanaacggn cgccaccncg gtgggagetc cagettttgt
                                                                        420
tecenttaat gaaggttaat tgenegettg gegtaateat nggteanaac tnttteetgt
                                                                        480
gtgaaattgt ttntcccctc ncnattccnc ncnacatacn aacccggaan cataaagtgt
                                                                        540
taaagcctgg gggtngcctn nngaatnaac tnaactcaat taattgcgtt ggctcatggc
                                                                        600
cegettteen ttenggaaaa etgtenteee etgenttnnt gaateggeea eeeeeenggg
                                                                        660
aaaagcggtt tgcnttttng ggggntcctt conctteece cctenetaan ecetnegect
                                                                        720
cggtcgttnc nggtngcggg gaangggnat nnnctcccnc naagggggng agnnngntat
                                                                       780
ccccaaa
                                                                       787
     <210> 31
     <211> 799
     <212> DNA
     <213> Homo sapien
     <220>
     <221> misc feature
     <222> (1) . . . (799)
     <223> n = A, T, C \text{ or } G
```

```
tttttttttt tttttttggc gatgctactg tttaattgca ggaggtgggg gtgtgtgtac
                                                                        60
catgtaccag ggctattaga agcaagaagg aaggagggag ggcagagcgc cctgctgagc
                                                                       120
aacaaaggac tcctgcagcc ttctctgtct gtctcttggc gcaggcacat ggggaggcct
                                                                       180
cccgcagggt gggggccacc agtccagggg tgggagcact acanggggtg ggagtgggtg
                                                                       240
gtggctggtn cnaatggcct gncacanatc cctacgattc ttgacacctg gatttcacca
                                                                       300
ggggacette tgttetecca nggnaactte ntnnateten aaagaacaca actgtttett
                                                                       360
engeanttet ggetgtteat ggaaageaca ggtgteenat ttnggetggg aettggtaca
                                                                       420
tatggtteeg geceacetet ecentenaan aagtaattea ececeecen centetnttg
                                                                       480
cctgggccct taantaccca caccggaact canttantta ttcatcttng gntgggcttg
                                                                       540
ntnatencen cetgaangeg ceaagttgaa aggeeaegee gtnecenete cecatagnan
                                                                       600°
nttttnnent canctaatge ecceeengge aacnateeaa teeceeeen tgggggeeee
                                                                       660
ageccangge eccegneteg ggnnneengn enegnantee ecaggntete ceantengne
                                                                       720
cenningence eccegcaceca gaacanaage ntingageene egeanninnin negtinienae
                                                                       780
                                                                       799
ctcgccccc ccnncgnng
      <210> 32
      <211> 789
      <212> DNA
       <213> Homo sapien
       <220>
      <221> misc feature-
       <222> (1) ... (789)
       \langle 223 \rangle n = A,T,C or G
       <400> 32
tttttttt ttttttt tttttttt tttttttt
                                                                        60
ttttnccnag ggcaggttta ttgacaacct cncgggacac aancaggctg gggacaggac
                                                                       120
ggcaacagge teeggeggeg geggeggegg ecetacetge ggtaccaaat ntgcageete
                                                                       180
egeteeeget tgatntteet etgeagetge aggatgeent aaaacaggge eteggeentn
                                                                       240
ggtgggcacc ctgggatttn aatttccacg ggcacaatgc ggtcgcancc cctcaccacc
                                                                       300
 nattaggaat agtggtntta eceneeneeg ttggeneaet eeeentggaa accaettnte
                                                                       360
geggeteegg catetggtet taaacettge aaacnetggg geeetetttt tggttantnt
                                                                       420
 ncengceaca atcatnacte agactggene gggetggeee caaaaaanen eeccaaaace
                                                                       480
 ggnccatgte ttnneggggt tgctgcnatn tncatcacet ecegggenea neaggncaae
                                                                        540
 ccaaaagttc ttgnggcccn caaaaaanct ccggggggnc ccagtttcaa caaagtcatc
                                                                       600
 cccettggcc cccaaatcct cccccgntt nctgggtttg ggaacccacg cctctnnctt
                                                                        660
 tggnnggcaa gntggntece eettegggee eeeggtggge eennetetaa ngaaaaenee
                                                                        720
 ntcctnnnca ccatccccc nngnnacgnc tancaangna tcccttttt tanaaacggg
                                                                        780
                                                                       789
 cccccncg
       <210> 33
       <211> 793
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (793)
       <223> n = A, T, C \text{ or } G
   ... <400> 33
 gacagaacat gttggatggt ggagcacctt tctatacgac ttacaggaca gcagatgggg
                                                                         60
 aattcatggc tgttggagca atanaacccc agttctacga gctgctgatc aaaggacttg
                                                                        120
 gactaaagtc tgatgaactt cccaatcaga tgagcatgga tgattggcca gaaatgaana
                                                                        180
 agaagtttgc agatgtattt gcaaagaaga cgaaggcaga gtggtgtcaa atctttgacg
                                                                        240
 geacagatge etgtgtgaet eeggttetga ettttgagga ggttgtteat eatgateaca
                                                                        300
 acaangaacg gggctcgttt atcaccantg aggagcagga cgtgagcccc cgccctgcac
                                                                        360
```

```
ctctgctgtt aaacacccca gccatccctt ctttcaaaag ggatccacta cttctagagc
                                                                        420
 ggnegecace geggtggage tecagetttt gtteeettta gtgagggtta attgegeget
                                                                        480
 tggcgtaatc atggtcatan ctgtttcctg tgtgaaattg ttatccgctc acaattccac
                                                                        540
 acaacatacg anceggaage atnaaatttt aaageetggn ggtngeetaa tgantqaact
                                                                        600
 nactcacatt aattggcttt gegeteactg ecegetttee agteeggaaa acetgteett
                                                                        660
gccagctgcc nttaatgaat enggccaccc ceeggggaaa aggengtttg ettnttgggg
                                                                        720
 cgcnettece getttetege tteetgaant eetteeece ggtetttegg ettgeggena
                                                                        780
 acggtatcna cct
                                                                        793
       <210> 34
       <211> 756
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(756)
      <223> n = A,T,C or G
      <400> 34
gccgcgaccg gcatgtacga gcaactcaag ggcgagtgga accgtaaaag ccccaatctt
                                                                         60
ancaagtgeg gggaanaget gggtegaete aagetagtte ttetggaget caacttettg
                                                                        120
ccaaccacag ggaccaagct gaccaaacag cagctaattc tggcccgtga catactggag
                                                                        180
ateggggee aatggageat ectaegeaan gacateeet eettegageg etaeatggee
                                                                        240
cageteaaat getaetaett tgattacaan gageagetee eegagteage etatatgeae
                                                                        300
cagetettgg geeteaacet eetetteetg etgteecaga acegggtgge tgantnecae
                                                                        360
acgganttgg ancggctgcc tgcccaanga catacanacc aatgtctaca tcnaccacca
                                                                        420
gtgtcctgga gcaatactga tgganggcag ctaccncaaa gtnttcctgg ccnagggtaa
                                                                        480
catececege egagagetae acettettea ttgacatect getegacaet ateagggatq
                                                                       540
aaaatcgcng ggttgctcca gaaaggctnc aanaanatcc ttttcnctga aggccccgg
                                                                       600
athenetagt netagaateg geeegeeate geggtggane etceaacett tegttheeet
                                                                       660
ttactgaggg ttnattgccg cccttggcgt tatcatggtc acnccngttn cctgtgttga
                                                                       720
aattnttaac ccccacaat tccacgccna cattng
                                                                       756
      <210> 35
      <211> 834
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(834)
      <223> n = A, T, C, or G
      <400> 35
ggggatetet anatenacet gnatgeatgg ttgteggtgt ggtegetgte gatgaanatg
                                                                        60
aacaggatet tgeeettgaa getetegget getgtnttta agttgeteag tetgeegtea
                                                                       120
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nccnaacttt tteetteeec eneceenegg ngtttggntt ttteatnggg ecceaactet
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  actggaaaaa ggtangtgcc ttccttgaat tcccaaantt cccctngntt tgggtnnttt
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 gccg
                                                                         724
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tteeeneeg negtetggee enteaand tot	753
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<223> n = A, T, C or G

<212> DNA

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484

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      <400> 70
atgaccecta acaggggeee teteageeet cetaatgace teeggeetag ceatgtgatt
                                                                         60
teacticeae tecataaege teeteataet aggeetaeta accaacaeae taaccatata
                                                                        120
ccaatgatgg cgcgatgtaa cacgagaaag cacataccaa ggccaccaca caccacctgt
                                                                        180
ccaaaaaggc cttcgatacg ggataatcct atttattacc tcagaagttt ttttcttcqc
                                                                        240
agggattttt ctgagccttt taccactcca gcctagcccc taccccccaa ctaggagggc
                                                                        300
actggccccc aacaggcatc accccgctaa atcccctaga agtcccactc ctaaacacat.
                                                                        360
ccgtattact cgcatcagga gtatcaatca cctgagctca ccatagtcta ataqaaaaca
                                                                        420
accgaaacca aattattcaa agcactgctt attacaattt tactgggtct ctatttt
                                                                        477.
      <210> 71
      <211> 533
      <212> DNA .
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (533)
      \langle 223 \rangle n = A,T,C or G
      <400> 71
agagetatag gtacagtgtg ateteagett tgcaaacaca ttttetacat agatagtact
                                                                         60
aggtattaat agatatgtaa agaaagaaat cacaccatta ataatggtaa gattggttta
                                                                        120
tgtgatttta gtggtatttt tggcaccett atatatgttt tecaaaettt cagcagtgat
                                                                        180
attatttcca taacttaaaa agtgagtttg aaaaagaaaa tctccagcaa gcatctcatt
                                                                        240
taaataaagg tttgtcatct ttaaaaatac agcaatatgt gactttttaa aaaagctqtc
                                                                        300
aaataggtgt gaccctacta ataattatta gaaatacatt taaaaacatc gagtacctca
                                                                        360
agtcagtttg ccttgaaaaa tatcaaatat aactcttaga gaaatgtaca taaaagaatg
                                                                        420
cttcgtaatt ttggagtang aggttcctc ctcaattttg tattttaaa aagtacatgg
                                                                        480
taaaaaaaaa aattcacaac agtatataag gctgtaaaat gaagaattct gcc
                                                                        533
      <210> 72
      <211> 511
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
```

```
<400> 72
tattacggaa aaacacacca cataattcaa ctancaaaga anactgcttc agggcgtgta
                                                                      60
aaatgaaagg cttccaggca gttatctgat taaagaacac taaaagaggg acaaggctaa
                                                                     120
aagccgcagg atgtctacac tatancaggc gctatttggg ttggctggag gagctgtgga
                                                                     180
aaacatggan agattggtgc tgganatcgc cgtggctatt cctcattgtt attacanagt
                                                                     240
gaggttetet gtgtgeecac tggtttgaaa accgttetne aataatgata gaatagtaca
                                                                     300
cacatgagaa ctgaaatggc ccaaacccag aaagaaagcc caactagatc ctcagaanac
                                                                     360
gettetaggg acaataaccg atgaagaaa gatggcetee ttgtgcecce gtetgttatg
                                                                     420
atttctctcc attgcagcna naaacccgtt cttctaagca aacncaggtg atgatggcna
                                                                     480
                                                                     511
aaatacaccc cctcttgaag naccnggagg a
      <210> 73
      <211> 499
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (499)
      \langle 223 \rangle n = A,T,C or G
      <400> 73
cagtgccage actggtgcca gtaccagtac caataacagt gccagtgcca gtgccagcac
cagtggtggc ttcagtgctg gtgccagcct gaccgccact ctcacatttg ggctcttcgc
                                                                      120
tggccttggt ggagctggtg ccagcaccag tggcagctct ggtgcctgtg gtttctccta
                                                                      180
caagtgagat tttagatatt gttaatcctg ccagtctttc tcttcaagcc agggtgcatc
                                                                      240
ctcagaaacc tactcaacac agcactctag gcagccacta tcaatcaatt gaagttgaca
                                                                      300
360
antctagagg gecegtttaa accegetgat cageetegae tgtgeettet anttgecage
                                                                      420
catetgttgt ttgcccctcc cccgntgcct tccttgaccc tggaaagtgc cactcccact
                                                                      480
                                                                      499
gtcctttcct aantaaaat
      :<210> 74
      <211> 537
      <212> DNA
       <213> Homo sapien
      <220>
       <221> misc feature
       <222> (1) . . . (537)
       <223> n = A, T, C or G
       <400> 74
 tttcatagga gaacacactg aggagatact tgaagaattt ggattcagcc gcgaagagat
                                                                       60
 ttatcagett aactcagata aaatcattga aagtaataag gtaaaageta gtetetaact
                                                                      120
 tecaggeeca eggeteaagt gaatttgaat actgeattta eagtgtagag taacacataa
                                                                      180
 cattgtatgc atggaaacat ggaggaacag tattacagtg tcctaccact ctaatcaaga
                                                                      240
 aaagaattac agactetgat tetacagtga tgattgaatt etaaaaatgg taatcattag
                                                                      300
 ggettttgat ttataanact ttgggtactt atactaaatt atggtagtta tactgeette
                                                                      360
 cagtttgctt gatatatttg ttgatattaa gattcttgac ttatattttg aatgggttct
                                                                      420
 actgaaaaan gaatgatata ttettgaaga categatata catttattta caetettgat
                                                                      480
 tctacaatgt agaaaatgaa ggaaatgccc caaattgtat ggtgataaaa gtcccgt
                                                                      537
```

<210> 75

<211> 467

<212> DNA

<213> Homo sapien

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```
<220>
      <221> misc_feature
      <222> (1)...(467)
      <223> n = A, T, C \text{ or } G
      <400> 75
caaanacaat tgttcaaaag atgcaaatga tacactactg ctgcagctca caaacacctc
                                                                         60
tgcatattac acgtacctcc tcctgctcct caagtagtgt ggtctatttt gccatcatca
                                                                         120
cetgetgtet gettagaaga acggetttet getgeaangg agagaaatca taacagaegg
                                                                        180
tggcacaagg aggccatctt ttcctcatcg gttattgtcc ctagaagcgt cttctgagga
                                                                        240
totagttggg ctttctttct gggtttgggc catttcantt ctcatgtgtg tactattcta
                                                                        300
tcattattgt ataacggttt tcaaaccngt gggcacncag agaacctcac tctgtaataa
                                                                        360
caatgaggaa tagccacggt gatctccagc accaaatctc tccatgttnt tccagagctc
                                                                        420
ctccagccaa cccaaatagc cgctgctatn gtgtagaaca tccctgn
                                                                        467
      <210> 76
      <211> 400
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(400)
      \langle 223 \rangle n = A,T,C or G
     `<400> 76
aagetgacag cattegggee gagatgtete geteegtgge ettagetgtg etegegetae
                                                                         60
tetetettte tggeetggag getateeage gtaeteeaaa gatteaggtt taeteaegte
                                                                        120
atccagcaga gaatggaaag tcaaatttcc tgaattgcta tgtgtctggg tttcatccat
                                                                        180
ccgacattga agttgactta ctgaagaatg gagagagaat tgaaaaagtg gagcattcag
                                                                        240
acttgtcttt cagcaaggac tggtctttct atctcttgta ctacactgaa ttcaccccca
                                                                        300
ctgaaaaaga tgagtatgcc tgccgtgtga accatgtgac tttgtcacag cccaagatng
                                                                        360
ttnagtggga tcganacatg taagcagcan catgggaggt
                                                                        400
      <210> 77
      <211> 248
      <212> DNA
      <213> Homo sapien
      <400> 77
ctggagtgcc ttggtgtttc aagcccctgc aggaagcaga atgcaccttc tgaggcacct
                                                                        . 60
ceagetgeee eggegggga tgegaggete ggageaceet tgeeeggetg tgattgetge
                                                                        120
caggeactgt teateteage ttttetgtee etttgeteee ggeaageget tetgetgaaa
                                                                        180
gttcatatct ggagcctgat gtcttaacga ataaaggtcc catgctccac ccgaaaaaaa
                                                                        240
aaaaaaaa
                                                                        248
      <210> 78
      <211> 201
      <212> DNA
      <213> Homo sapien
      <400> 78
actagtecag tgtggtggaa ttecattgtg ttgggeeeaa cacaatgget acetttaaca
                                                                         60
tcacccagac cccgccctgc ccgtgcccca cgctgctgct aacgacagta tgatgcttac
                                                                        120
totgotacto ggaaactatt tttatgtaat taatgtatgo tttottgttt ataaatgoot
                                                                        180
gatttaaaaa aaaaaaaaa a
                                                                        201
```

```
<210> 79
      <211> 552
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(552)
      <223> n = A,T,C or G
      <400> 79
teettttgtt aggtttttga gacaacccta gacctaaact gtgtcacaga cttctgaatg
                                                                         60
tttaggcagt gctagtaatt tcctcgtaat gattctgtta ttactttcct attctttatt
                                                                        120
cetettett etgaagatta atgaagttga aaattgaggt ggataaatac aaaaaggtag
                                                                        180
tgtgatagta taagtatcta agtgcagatg aaagtgtgtt atatatatcc attcaaaatt
                                                                        240
atgcaagtta gtaattactc agggttaact aaattacttt aatatgctgt tgaacctact
                                                                        300
ctgttccttg gctagaaaaa attataaaca ggactttgtt agtttgggaa gccaaattga
                                                                        360
taatattota tgttotaaaa gttgggotat acataaanta tnaagaaata tggaatttta
                                                                        420
ttcccaggaa tatggggttc atttatgaat antacccggg anagaagttt tgantnaaac
                                                                        480
cngttttggt taatacgtta atatgtcctn aatnaacaag gcntgactta tttccaaaaa
                                                                        540
                                                                       - 552
aaaaaaaaa aa
      <210> 80
      <211> 476
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (476)
       \langle 223 \rangle n = A,T,C or G
       <400> 80
acagggattt gagatgctaa ggccccagag atcgtttgat ccaaccctct tattttcaga
                                                                         60
ggggaaaatg gggcctagaa gttacagagc atctagctgg tgcgctggca cccctggcct
cacacagact cccgagtagc tgggactaca ggcacacagt cactgaagca ggccctgttt
                                                                         180
gcaattcacg ttgccacctc caacttaaac attcttcata tgtgatgtcc ttagtcacta
                                                                         240
aggttaaact ttcccaccca gaaaaggcaa cttagataaa atcttagagt actttcatac
                                                                         300
tettetaagt cetettecag ceteactitg agteeteett gggggttgat aggaaninte
                                                                         360
 tettggettt etcaataaaa tetetateea teteatgttt aatttggtae gentaaaaat
                                                                         420
 gctgaaaaaa ttaaaatgtt ctggtttcnc tttaaaaaaa aaaaaaaa aaaaaa
                                                                         476
       <210> 81
       <211> 232-
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(232)
       <223> n = A,T,C or G
        <400> 81
 tttttttttt tatgeenten etgtggngtt attgttgetg ceaccetgga ggageceagt
 ttettetgta tetttettt etgggggate tteetggete tgeeceteca tteecageet
                                                                         120
 ctcatcccca tcttgcactt ttgctagggt tggaggcgct ttcctggtag cccctcagag
                                                                         180
                                                                         232
 actcagtcag cgggaataag tcctaggggt ggggggtgtg gcaagccggc ct
```

```
<210> 82
       <211> 383
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature .
       <222> (1)...(383)
       <223> n = A, T, C \text{ or } G
       <400> 82
 aggegggage agaagetaaa gecaaageee aagaagagtg geagtgeeag caetggtgee
 agtaccagta ccaataacat gccagtgcca gtgccagcac cagtggtggc ttcagtgctg
                                                                          120
 gtgccagcct gaccgccact ctcacatttg ggctcttcgc tggccttggt ggagctggtg
                                                                          180
 ccagcaccag tggcagctct ggtgcctgtg gtttctccta caagtgagat tttagatatt
                                                                          240
 gttaatcctg ccagtctttc tcttcaagcc agggtgcatc ctcagaaacc tactcaacac
                                                                          300
 agcactetng geagecacta teaateaatt gaagttgaca etetgeatta aatetatttg
                                                                          360
 ccatttcaaa aaaaaaaaa aaa
                                                                          383
       <210> 83
       <211> 494
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (494)
       \langle 223 \rangle n = A,T,C or G
      <400> 83
accgaattgg gaccgctggc ttataagcga tcatgtcctc cagtattacc tcaacqaqca
                                                                          60
gggagatcga gtctatacgc tgaagaaatt tgacccgatg ggacaacaga cctgctcagc
                                                                         120
ccatcctgct cggttctccc cagatgacaa atactctcga caccgaatca ccatcaagaa
                                                                         180
acgetteaag gtgeteatga cecageaace gegeeetgte etetgagggt cettaaactg
                                                                         240
atgtetttte tgecacetgt tacceetegg agacteegta accaaactet teggactgtg
                                                                         300
agecetgatg cettitigee agecatacie titiggentee agtetetegt ggegatigat
                                                                         360
tatgettgtg tgaggeaate atggtggéat cacceatnaa gggaacaeat ttgantttt
                                                                         420
tttcncatat tttaaattac naccagaata nttcagaata aatgaattga aaaactctta
                                                                         480
aaaaaaaaa aaaa
                                                                         494
      <210> 84
      <211> 380
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (380)
      \langle 223 \rangle n = A,T,C or G
      <400> 84
gctggtagcc tatggcgtgg ccacggangg gctcctgagg cacgggacag tgacttccca
                                                                          60
agtateetge geegegtett etacegteee tacetgeaga tettegggea gatteeecag
                                                                         120
gaggacatgg acgtggccct catggagcac agcaactgct cgtcggagcc cggcttctgg
                                                                         180
gcacaccctc ctggggccca ggcgggcacc tgcgtctccc agtatgccaa ctggctggtg
                                                                         240
gtgctgctcc tcgtcatctt cctgctcgtg gccaacatcc tgctggtcac ttgctcattg
                                                                         300
ccatgttcag ttacacattc ggcaaagtac agggcaacag cnatctctac tgggaaggcc
                                                                         360
agegttneeg cetcateegg
                                                                         380
```

```
<210> 85
     <211> 481
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (481)
      <223> n = A, T, C \text{ or } G
     <400> 85
gagttagete etecacace ttgatgaggt egtetgeagt ggeetetege tteatacege
                                                                        60
tnecategte atactgtagg tttgccacca ceteetgeat ettggggegg etaatateca
                                                                       120
ggaaactete aatcaagtea cegtenatna aacetgtgge tggttetgte tteegetegg
                                                                        180
tgtgaaagga tctccagaag gagtgctcga tcttccccac acttttgatg acttattga
                                                                        240
gtegattetg catgtecage aggaggttgt accagetete tgacagtgag gteaccagee
                                                                        300
ctatcatgcc nttgaacgtg ccgaagaaca ccgagccttg tgtggggggt gnagtctcac
                                                                        360
ccagattctg cattaccaga nagccgtggc aaaaganatt gacaactcgc ccaggnngaa
                                                                        420
aaagaacacc teetggaagt getngeeget cetegteent tggtggnnge gentneettt
                                                                        480.
                                                                        481
      <210> 86
     <211> 472
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (472)
      <223> n = A, T, C or G
      <400> 86
aacatcttcc tgtataatgc tgtgtaatat cgatccgatn ttgtctgctg agaattcatt
acttggaaaa gcaacttnaa gcctggacac tggtattaaa attcacaata tgcaacactt
                                                                        120
taaacagtgt gtcaatctgc tcccttactt tgtcatcacc agtctgggaa taagggtatg
                                                                        180
ccctattcac acctgttaaa agggcgctaa gcatttttga ttcaacatct tttttttga
                                                                        240
cacaagteeg aaaaaageaa aagtaaacag tinttaatit gitageeaat teactitett
                                                                        300
catgggacag agccatttga tttaaaaagc aaattgcata atattgagct ttgggagctg
                                                                        360
atatntgage ggaagantag cetttetaet teaccagaca caacteettt catattggga
                                                                        420
 tgttnacnaa agttatgtct cttacagatg ggatgctttt gtggcaattc tg
                                                                        472
       <210> 87
       <211> 413
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(413)
       <223> n = A,T,C or G
      `<400> 87 . ·
 agaaaccagt atctctnaaa acaacctctc ataccttgtg gacctaattt tgtgtgcgtg
                                                                          60
 tgtgtgtgcg cgcatattat atagacaggc acatcttttt tacttttgta aaagcttatg
                                                                         120
 cetetttggt atetatet gtgaaagttt taatgatetg ceataatgte ttggggacet
                                                                         180
 ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagttngt
                                                                         240
 tttattcgac atgaaggaaa tttccagatn acaacactna caaactctcc cttgactagg
                                                                         300
```

```
ggggacaaag aaaagcanaa ctgaacatna gaaacaattn cctggtgaga aattncataa
                                                                          360
 acagaaattg ggtngtatat tgaaananng catcattnaa acgtfffttt fft
                                                                         413
       <210> 88
       <211> 448
       <212> DNA
       <213> Homo sapien
       <220>
      <221> misc_feature
       <222> (1)...(448)
      <223> n = A,T,C or G
       <400> 88
 egeagegggt cetetetate tagetecage etetegeetg ecceaetece egeqtecege
gtectageen accatggeeg ggeeeetgeg egeeeegetg etectgetgg ceateetgge
                                                                         120
 cgtggccctg gecgtgagee eegeggeegg etecagteee ggeaageege egegeetqgt
                                                                         180
gggaggccca tggaccccgc gtggaagaag aaggtgtgcg gcgtgcactg gactttgccg
                                                                         240
 teggenanta caacaaacce geaacnactt ttacenagen egegetgeag gttgtgeege
                                                                         300
cccaancaaa ttgttactng gggtaantaa ttcttggaag ttgaacctgg gccaaacnng
                                                                         360
tttaccagaa cenagecaat tngaacaatt neceetecat aacageeeet tttaaaaaqq
                                                                         420
gaancantcc tgntcttttc caaatttt
                                                                         448
      <210> 89
      <211> 463
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (463)
      <223> n = A, T, C \text{ or } G
      <400> 89
gaattttgtg cactggccac tgtgatggaa ccattgggcc aggatgcttt gagtttatca
                                                                         60
gtagtgattc tgccaaagtt ggtgttgtaa catgagtatg taaaatgtca aaaaattagc
                                                                        120
agaggtctag gtctgcatat cagcagacag tttgtccgtg tattttgtag ccttgaagtt
                                                                        180
ctcagtgaca agttnnttct gatgcgaagt tctnattcca gtgttttagt cctttgcatc
                                                                        240
tttnatgttn agaettgeet etntnaaatt gettttgint tetgeaggta etatetgtgg
                                                                        300
tttaacaaaa tagaannact tctctgcttn gaanatttga atatcttaca tctnaaaatn
                                                                        360
aattetetee ecatannaaa acceangeee ttggganaat ttgaaaaang gnteettenn
                                                                        420
aattennana antteagntn teatacaaca naaenggane eec
                                                                        463
      <210> 90
      <211> 400
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(400)
      <223> n = A,T,C or G
      <400> 90
agggattgaa ggtctnttnt actgtcggac tgttcancca ccaactctac aagttgctgt
                                                                        . 60
cttccactca ctgtctgtaa gcntnttaac ccagactgta tcttcataaa tagaacaaat
                                                                        120
tetteaccag teacatette taggacettt ttggatteag ttagtataag etetteeact
                                                                        180
teetttgtta agaetteate tggtaaagte ttaagttttg tagaaaggaa tttaattget
                                                                        240
```

cgttctctaa caatgtcctc to	cttgaagt a	atttggctga	acaacccacc	tnaagtccct	300
ttgtgcatcc attttaaata ta	acttaatag (gcattggtn	cactaggtta	aattctgcaa	360
gagtcatctg tctgcaaaag tt	tacattaat	atatetgeca			400
gagtcatctg telgeadad to		3	• 36		•
210. 23		(Y)	- a		
<210> 91		*	EU/7 a		
<211> 480	. *		* 11		
<212> DNA	- 120	7		1.0	
<213> Homo sapien	. 10	· · · · · · · · · · · · · · · · · · ·			* * * * * * * * * * * * * * * * * * * *
<220>				* * * * * * * * * * * * * * * * * * * *	• • • •
<221> misc_featur	e	9 10			0.4
<222> (1) (480)			*	2 ⁽²⁾	
$\langle 223 \rangle n = A, T, C o$			· .		
				9 0	A .
4005 91	1 1		****		
<pre><400> 91 gagctcggat ccaataatct t</pre>	tatatasaa	gcagcacaca	tatncaqtqc	catggnaact	. 60
gageteggat ceaataatet t	tanget	agntatataa	ggtcattccc	tgagtcagac	120
ggtctacccc acatgggagc a	geargeege	testecte	acacacctcc	nnccactett	180
atgcctcttt gactaccgtg t	gccagtgct	ggrgarier	acttaceast	traccracga	240
Laterace atagasatta n	ctagaacta	ocaadacatt	actiacadat.	CCGCCCGG	300
	adcdactct.	tocalluct.	Lugue	-c95-c4-c-3-	360
the second of th	tracereca	ECACALLUGE.	qattegeuge.		420
	CEECEECEE	EEGELLCada	agcaaccccc	990900300	
ngatcaggtt cccatttccc a	gtccgaatg	ttcacatggc	atatnttact	tcccacaaaa	480
					50
<210> 92					7.1
<211> 477	- T			*	
<212> DNA				3	7
<213> Homo sapier	1		* *		* 8
(213) Homo Sapier	-		\$		7
.220					
<220>					0 -
<221> misc_featur		* a_			
<222> (1) (477)		477			
<223> n = A,T,C)I G	With the second	*	1 1011	
<400> 92			dadaacotoa	tacaatcact	60
atacagecca nateceacca	cgaagatgcg	cccgccgacc	gayaacciga	tacacteett	120
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terntagger sagaggetga (ccacctcdcd.	glecaleayy	acycecyae	5	300
terreserve etectogate	arcatgaggg	qqaaqcqaac	gangeecagg	30000300	
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announced appropriate (maacagccgc	acctcacqga	Lycccancy	gregegeee	
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$\langle 223 \rangle$ n = A,T,C	or G			*	* * * * * * * * * * * * * * * * * * * *
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uunooo			10			
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 gtttccattg tgttttgccg atcttctggc taatcgtggt atcctccatg ttattagtaa
                                                                          180
 ttetgtatte cattttgtta acgeetggta gatgtaacet getangagge taaetttata
                                                                          240
 cttatttaaa agctcttatt ttgtggtcat taaaatggca atttatgtgc agcactttat
                                                                          300
 tgcagcagga agcacgtgtg ggttggttgt aaagctcttt gctaatctta aaaagtaatg
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                                                                          362
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                                                                         120
gttctcccag gttcgccctg ctgctccaag tctcagcagc agcctctttt aggaggcatc
                                                                         180
ttetgaacta gattaaggea gettgtaaat etgatgtgat ttggtttatt atceaactaa
                                                                         240
cttccatctg ttatcactgg agaaagccca gactccccan gacnggtacg gattgtgggc
                                                                         300
atanaaggat tgggtgaagc tggcgttgtg gt
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       <211> 322
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                                                                         120
ctcaaattcc caaacagggg ctctgtggga aaaatgaggg aggacctttg tatctcgggt
                                                                         180
tttagcaagt taaaatgaan atgacaggaa aggcttattt atcaacaaag agaagagttg
                                                                         240
ggatgcttct aaaaaaaact ttggtagaga aaataggaat gctnaatcct agggaagcct
                                                                         300
gtaacaatct acaattggtc ca
                                                                         322
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                                                                        120
ctatttaaaa aaaatcacaa atctttccct ttaagctatg ttnaattcaa actattcctg
                                                                        180
ctattcctgt tttgtcaaag aaattatatt tttcaaaata tgtntatttg tttgatgggt
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278
cccacgaaac actaataaaa accacagaga ccagcctg
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                                                                         120
aaacttgata cttttgttct aagtaggaac tagtatacag tncctaggan tggtactcca
                                                                         180.
gggtgccccc caactcctgc agccgctcct ctgtgccagn ccctgnaagg aactttcgct
                                                                         240
 ccacctcaat caageeetgg gecatgetae etgeaattgg etgaacaaac gtttgetgag
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ttcccaagga tgcaaagcct ggtgctcaac tcctggggcg tcaactcagt
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 geagacttgt gtetgeette aanaageeag acaggaagge eetgeetgee ttggetetga
                                                                          180
 cetggcggcc agccagccag ccacaggtgg gettetteet tttgtggtga caacnecaag
                                                                          240
                                                                          300
 aaaactgcag aggcccaggg tcaggtgtna gtgggtangt gaccataaaa caccaggtgc
 teccaggaac cegggeaaag gecatececa cetacageca geatgeecae tggegtgatg
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                                                                         120
 ttggctggtc ccactggtgg tcactgtcat tggtggggtt cctgt
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                                                                         120
tgctgggcag tctcccatgc cttccacagt gaaagggctt gagaaaaatc acatccaatg
                                                                         180
tcatgtgttt ccagccacac caaaaggtgc ttggggtgga gggctggggg catananggt
                                                                         240
cangeeteag gaageeteaa gtteeattea getttgeeae tgtacattee ceatnittaa
                                                                         300
 aaaaactgat gccttttttttttttttttg taaaattc
                                                                         338
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      <211> 382
      <212> DNA
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attcaaacag acctcgtcat tcctggtgtg agcctggtcg gctcaccgcc tatcatctgc
                                                                        180
atttgcctta ctcaggtgct accggactct ggcccctgat gtctgtagtt tcacaggatg
                                                                        240
cettatttgt ettetacace ceacagggee ecetaettet teggatgtgt ttttaataat
                                                                        300
gtcagctatg tgccccatcc tccttcatgc cctccctccc tttcctacca ctgctgagtg
                                                                        360
gcctggaact tgtttaaagt gt
                                                                        382
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                                                                        120
ttttcacatt tcaacttgta tgtgtttgtc tcttanagca ttggtgaaat cacatatttt
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atattcagca taaaggagaa
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                                                                       120
atgcatgtag agaacccaaa ctaatttatt aaacaggata gaaacaggct gtctgggtga
                                                                       180
aatggttetg agaaccatec aatteacetg teagatgetg atanactage tetteagatg
tttttctacc agttcagaga tnggttaatg actanttcca atggggaaaa agcaagatgg
                                                                      300
                                                                       335
attcacaaac caagtaattt taaacaaaga cactt
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                                                                         60
gggttgttta aagacaaccc agcttaatat caagagaaat tgtgaccttt catggagtat
                                                                        120
 ctgatggaga aaacactgag ttttgacaaa tcttatttta ttcagatagc agtctgatca
                                                                        180
 cacatggtcc aacaacactc aaataataaa tcaaatatna tcagatgtta aagattggtc
                                                                        240
 ttcaaacatc atagccaatg atgccccgct tgcctataat ctctccgaca taaaaccaca
                                                                        300
 tcaacacctc agtggccacc aaaccattca gcacagcttc cttaactgtg agctgtttga
                                                                        360
 agctaccagt ctgagcacta ttgactatnt ttttcangct ctgaatagct ctagggatct
                                                                        420
                                                                         459
 cagcangggt gggaggaacc agctcaacct tggcgtant
       <210> 143
       <211> 140
        <212> DNA
       <213> Homo sapien
 acattteett ecaceaagte aggacteetg gettetgtgg gagttettat cacetgaggg
                                                                          60
  aaatccaaac agtctctcct agaaaggaat agtgtcacca accccaccca tctccctgag
                                                                         120
                                                                         140
  accatccgac ttccctgtgt
        <210> 144
        <211> 164
        <212> DNA
        <213> Homo sapien
        <220>
        <221> misc feature
        <222> (1) ... (164)
        <223> n = A,T,C \text{ or } G
```

```
<400> 144
 acticagtaa caacatacaa taacaacatt aagtgtatat tgccatcttt gtcattttct
                                                                           60
 atctatacca ctctcccttc tgaaaacaan aatcactanc caatcactta tacaaatttg
                                                                          120
 aggcaattaa tocatatttg ttttcaataa ggaaaaaaaq atgt
                                                                          164
      . <210> 145
       <211> 303
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (303)
       <223> n = A,T,C \text{ or } G
       <400> 145
 acgtagacca tecaactttg tatttgtaat ggeaaacate cagnagcaat tectaaacaa
 actggagggt atttataccc aattatccca ttcattaaca tgccctcctc ctcaggctat
                                                                         120
 geaggaeage tateataagt eggeeeagge atceagatac taccatttgt ataaacttea
                                                                         180
 gtaggggagt ccatccaagt gacaggtcta atcaaaggag gaaatggaac ataagcccag
                                                                         240
 tagtaaaatn ttgcttagct gaaacagcca caaaagactt accgccgtgg tgattaccat
                                                                         300
                                                                         303
       <210> 146
       <211> 327
       <212> DNA
       <213> Homo sapien
       <220> .
       <221> misc feature
       <222> (1)...(327)
       <223> n = A, T, C or G
      <400> 146
actgcagete aattagaagt ggtetetgae tttcateane ttetecetgg getecatgae
                                                                          60
actggcctgg agtgactcat tgctctggtt ggttgagaga gctcctttgc caacaggcct
                                                                         120
ccaagtcagg gctgggattt gtttcctttc cacattctag caacaatatg ctggccactt
                                                                         180
cctgaacagg gagggtggga ggagccagca tggaacaagc tgccactttc taaagtagcc
                                                                         240
agacttgccc ctgggcctgt cacacctact gatgaccttc tgtgcctgca ggatggaatg
                                                                         300
taggggtgag ctgtgtgact ctatggt
                                                                         327
      <210> 147
      <211> 173
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (173)
      <223> n = A, T, C or G
      <400> 147 ·
acattgtttt tttgagataa agcattgana gagctctcct taacgtgaca caatggaagg
                                                                        . 60
actggaacac atacccacat ctttgttctg agggataatt ttctgataaa gtcttgctgt
                                                                        120
atattcaage acatatgtta tatattatte agttecatgt ttatageeta gtt
                                                                        173
```

<212> DNA

```
<211> 477
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (477)
      <223> n = A,T,C or G
      <400> 148
acaaccactt tateteateg aatttttaac ecaaacteac teactgtgee tttetateet
                                                                        60
atgggatata ttatttgatg ctccatttca tcacacatat atgaataata cactcatact
geoctactae etgetgeaat aatcacatte cetteetgte etgaceetga agecattggg
gtggtcctag tggccatcag tccangcctg caccttgagc ccttgagctc cattgctcac
                                                                       240
necaneceae eteaecgace ecatectett acacagetae eteettgete tetaaececa
                                                                       300
tagattatnt ccaaattcag tcaattaagt tactattaac actctacccg acatgtccag
                                                                       360
caccactggt aagcettete cagccaacac acacacacac acacncacac acacacatat
                                                                       420
ccaggcacag gctacctcat cttcacaatc acccctttaa ttaccatgct atggtgg
                                                                       477
      <210> 149
      <211> 207
 <212> DNA
      <213> Homo sapien
       <400> 149
acagttgtat tataatatca agaaataaac ttgcaatgag agcatttaag agggaagaac
                                                                         60
taacgtattt tagagagcca aggaaggttt ctgtggggag tgggatgtaa ggtggggcct
                                                                        120
gatgataaat aagagtcagc caggtaagtg ggtggtgtgg tatgggcaca gtgaagaaca
                                                                        180
                                                                        207
 tttcaggcag agggaacagc agtgaaa
       <210> 150
       <211> 111
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (111)
       \langle 223 \rangle n = A,T,C or G
       <400> 150
 accttgattt cattgctgct ctgatggaaa cccaactatc taatttagct aaaacatggg
                                                                        111
 cacttaaatg tggtcagtgt ttggacttgt taactantgg catctttggg t
       <210> 151
       <211> 196
       <212> DNA
        <213> Homo sapien
       <400> 151
 agegeggeag gteatattga acattecaga tacetateat tactegatge tgttgataae
                                                                          60
 agcaagatgg ctttgaactc agggtcacca ccagctattg gaccttacta tgaaaaccat
                                                                         120
 ggataccaac cggaaaaccc ctateccgca cagcccactg tggtccccac tgtctacgag
                                                                         180
                                                                         196
  gtgcatccgg ctcagt
        <210> 152
        <211> 132
```

<211> 295 <212> DNA

<213> Homo sapien

```
<400> 152
 acagcacttt cacatgtaag aagggagaaa ttcctaaatg taggagaaag ataacagaac
                                                                          60
 cttccccttt tcatctagtg gtggaaacct gatgctttat gttgacagga atagaaccag
                                                                         120
 gagggagttt gt
                                                                         132
       <210> 153
       <211> 285
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(285)
       <223> n = A,T,C or G
       <400> 153
 acaanaccca nganaggcca ctggccgtgg tgtcatggcc tccaaacatg aaagtgtcag
                                                                          60
 cttctgctct tatgtcctca tctgacaact ctttaccatt tttatcctcg ctcagcagga
                                                                         120
 gcacatcaat aaagtccaaa gtcttggact tggccttggc ttggaggaag tcatcaacac
                                                                         180
 cctggctagt gagggtgcgg cgccgctcct ggatgacggc atctgtgaag tcgtgcacca
                                                                        240
 gtctgcaggc cctgtggaag cgccgtccac acggagtnag gaatt
                                                                         285
       <210> 154
       <211> 333
       <212> DNA
       <213> Homo sapien
      <400> 154
accacagtee tgttgggeea gggetteatg accetttetg tgaaaageea tattateace
accccaaatt tttccttaaa tatctttaac tgaaggggtc agcctcttga ctgcaaagac
                                                                        120
cctaagccgg ttacacagct aactcccact ggccctgatt tgtgaaattg ctgctgcctg
                                                                        180
attggcacag gagtcgaagg tgttcagctc ccctcctccg tggaacgaga ctctgatttg.
                                                                        240
agtttcacaa attctcgggc cacctcgtca ttgctcctct gaaataaaat ccggagaatg
                                                                        300
gtcaggcctg tctcatccat atggatcttc cgg
                                                                        333
      <210> 155
      <211> 308
      <212> DNA
      <213 > Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (308)
      <223> n = A, T, C \text{ or } G
      <400> 155
actggaaata ataaaaccca catcacagtg ttgtgtcaaa gatcatcagg gcatggatgg
                                                                         60
gaaagtgett tgggaactgt aaagtgeeta acacatgate gatgattttt gttataatat.
                                                                        120
ttgaatcacg gtgcatacaa actctcctgc ctgctcctcc tgggccccag ccccagcccc
                                                                        180
atcacagete actgetetgt teatecagge ceageatgta gtggetgatt ettettgget
                                                                        240
gettttagee tecanaagtt tetetgaage caaccaaace tetangtgta aggeatgetg
                                                                       300
gccctggt
                                                                        308
      <210> 156
```

<213> Homo sapien

<213> Homo Sapron	*			
			* *	0.2
<400> 156	actosasata	rgagatgata	acagtgccta	60
<pre><400> 156 accttgctcg gtgcttggaa catattagga</pre>	theettasa :	attttctaca	caggaactga	120
				180
				240
				295
ctaatatatt ctcaatcaaa taaggttage aaaaccagat gtctatcctt aagattttca	aatagaaaac	aaattaacay	actat	, , , , , ,
			*	
<210> 157				
<211> 126				4
<212> DNA				*
<213> Homo sapien				
		a granda da d		
400, 157				*
<pre><400> 157 acaagtttaa atagtgctgt cactgtgcat</pre>	gtgctgaaat	gtgaaatcca	ccacatttct	60
gaagagcaaa acaaattetg teatgtaate	tctatcttqq	gtcgtgggta	tatctgtccc	120
			X .	126
cttagt			* *	
<210> 158				
<211> 442			The state of the s	
- (212>-DNA	andre menskanskringerik in f	TO THE REPORT OF THE PROPERTY OF	maka intertum aparena sepat sept.	iga patronia ir
<213> Homo sapien				
<220>				
<221> misc_feature	0. *	* * * * * * * * * * * * * * * * * * * *		
<222> (1)(442)			*	4.
$\langle 223 \rangle$ n = A,T,C or G			* .	
	0			
<400> 158		tttctatca	rgrgaaaatg	60
<pre><400> 158 acccactggt cttggaaaca cccatcctta</pre>	atacyatyat	aaaaaaaat	ttgagaaagt	120
				180
				240
				300
				360
				420
nacagacggg ctctttgcag agccgggact	: ctgagangga	catgagggcc	Congression	442
tgttcattct ctgatgtcct gt				
			· v	
<210> 159	*			
<211> 498				
<212> DNA		110		
	the second secon			
<213> Homo sapien				
<213> Homo sapien		e de la companya de Companya de la companya de la compa		
			te de la companya de La companya de la co La companya de la compan	
<220>				
<220> <221> misc_feature				
<220> <221> misc_feature <222> (1)(498)				
<220> <221> misc_feature				
<220> <221> misc_feature <222> (1) (498) <223> n = A,T,C or G				
<pre><220> <221> misc_feature <222> (1) (498) <223> n = A,T,C or G <400> 159</pre>	a geetgaacts	, atgggtgac	g ttgtaggttc	60
<pre></pre>	r addudaadaa	. 40040000	3 443444	120
<pre><220></pre>	t agggaagagt	gttgtggaa	c tggcanaaag	120 180
<pre><220></pre>	t agggaagag t acggcccaag + otootaggti	gttgtggaa gtgggctct	c tggcanaaag t caacaggggc	120 180 240
<pre><220></pre>	t agggaagagt t acggcccaag t gtggtaggtt	gttgtggaa gtgggctct cttggccag	c tggcanaaag t caacaggggc c tctggaaagt	120 180 240 300
<pre><220></pre>	t agggaagagt t acggcccaag t gtggtaggtt t gtcacttgag	g gttgtggaa gtgggctct g cttggccag a ngggtcant	c tggcanaaag t caacaggggc c tctggaaagt g ttgtgtgtaa	120 180 240 300 360
<pre><220></pre>	t agggaagag t acggcccaag t gtggtaggtt t gtcacttgag t ggagctggca	gttgtggaa gtgggctct cttggccag ngggtcant	c tggcanaaag t caacaggggc c tctggaaagt g ttgtgtgtaa t tatggtgtcn	120 180 240 300 360 420
<pre><220></pre>	t agggaagag t acggcccaag t gtggtaggtt t gtcacttgag t ggagctggca	gttgtggaa gtgggctct cttggccag ngggtcant	c tggcanaaag t caacaggggc c tctggaaagt g ttgtgtgtaa t tatggtgtcn	120

> rain de Para d La composição de Para d

```
aagggaataa gctgtggt
                                                                          498
        <210> 160
        <211> 380
        <212> DNA
        <213> Homo sapien
        <220>
       <221> misc_feature
       <222> (1)...(380)
        <223> n = A,T,C or G
       <400> 160
 acctgcatcc agettecetg ccaaactcac aaggagacat caacctctag acagggaaac
                                                                          60
 agetteagga taetteeagg agacagagee accageagea aaacaaatat teecatgeet
                                                                         120
 ggagcatggc atagaggaag ctganaaatg tggggtctga ggaagccatt tgagtctggc
                                                                         180
 cactagacat ctcatcagcc acttgtgtga agagatgccc catgacccca gatgcctctc
                                                                         240
 ccaccettae etecatetea cacaettgag etttecacte tgtataatte taacateetg
                                                                         300
 gagaaaaatg gcagtttgac cgaacctgtt cacaacggta gaggctgatt tctaacgaaa
                                                                         360
 cttgtagaat gaagcctgga
       <210> 161
       <211> 114
       <212> DNA
       <213> Homo sapien
       <400> .161
 actecacate cectetgage aggeggttgt egtteaaggt gtatttggee ttgcetgtea
cactgtccac tggcccctta tccacttggt gcttaatccc tcgaaagagc atgt
       <210> 162
       <211> 177
       <212> DNA
       <213> Homo sapien
       <400> 162
actitictgaa tcgaatcaaa tgatacttag tgtagttita atatcctcat atatatcaaa
                                                                          60
gttttactac tetgataatt ttgtaaacca ggtaaccaga acatecagte atacagettt
                                                                         120
tggtgatata taacttggca ataacccagt ctggtgatac ataaaactac tcactgt
                                                                         177
       <210> 163
       <211> 137
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
     <222> (1)...(137)
      \langle 223 \rangle n = A,T,C or G
      <400> 163
catttataca gacaggegtg aagacattca egacaaaaac gegaaattet atecegtgac
                                                                         60
canagaagge agetacgget actectacat cetggegtgg gtggeetteg cetgeacett
                                                                        120
catcagcggc atgatgt
                                                                        137
      <210> 164
      <211> 469
      <212> DNA
```

```
<213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (469)
       <223> n = A, T, C or G
       <400> 164
cttatcacaa tgaatgttct cctgggcagc gttgtgatct ttgccacctt cgtgacttta
 tgcaatgcat catgctattt catacctaat gagggagttc caggagattc aaccaggaaa
                                                                         120
 tgcatggatc tcaaaggaaa caaacaccca ataaactcgg agtggcagac tgacaactgt
                                                                         180
 gagacatgca cttgctacga aacagaaatt tcatgttgca cccttgtttc tacacctgtg
                                                                         240
 ggttatgaca aagacaactg ccaaagaatc ttcaagaagg aggactgcaa gtatatcgtg
                                                                         300
 gtggagaaga aggacccaaa aaagacctgt tctgtcagtg aatggataat ctaatgtgct
                                                                         360
 tetagtagge acagggetee caggecagge etcattetee tetggeetet aatagteaat
                                                                         420.
 gattgtgtag ccatgcctat cagtaaaaag atntttgagc aaacacttt
                                                                         469
       <210> 165
       <211> 195
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
        <222> (1)...(195)
        <223> n = A,T,C or G
        <400> 165
 acagtttttt atanatatcg acattgccgg cacttgtgtt cagtttcata aagctggtgg
                                                                          .60
 atccgctgtc atccactatt ccttggctag agtaaaaatt attcttatag cccatgtccc
                                                                         120
 tgcaggccgc ccgcccgtag ttctcgttcc agtcgtcttg gcacacaggg tgccaggact
                                                                         180
                                                                         195
  tcctctgaga tgagt
        <210> 166
        <211> 383
        <212> DNA
        <213> Homo sapien
        <220>
        <221> misc feature
        <222> (1) ... (383)
        <223> n = A,T,C or G
        <400> 166
  acatettagt agtgtggcae atcaggggge catcagggte acagteacte atagcetege
  cgaggtcgga gtccacacca ccggtgtagg tgtgctcaat cttgggcttg gcgcccacct
                                                                         120
  ttggagaagg gatatgctgc acacacatgt ccacaaagcc tgtgaactcg ccaaagaatt
                                                                          180
  tttgcagacc agcctgagca aggggcggat gttcagcttc agctcctcct tcgtcaggtg
                                                                          240
  gatgecaace tegtetangg teegtgggaa getggtgtee aenteaceta caacetggge
                                                                          300
  gangatetta taaagagget eenagataaa etecaegaaa ettetetggg agetgetagt
                                                                          360
                                                                          383
  nggggccttt ttggtgaact ttc
        <210> 167
        <211> 247
        <212> DNA
        <213> Homo sapien
```

<220>

```
<221> misc_feature
       <222> (1) . . . (247)
       <223> n = A, T, C or G
       <400> 167
acagagecag accttggeca taaatgaane agagattaag actaaacece aagteganat
                                                                          60
tggagcagaa actggagcaa gaagtgggcc tggggctgaa gtagagacca aggccactgc
                                                                         120
tatanccata cacagageca acteteagge caaggenatg gttggggcag anecagagae
                                                                         180
tcaatctgan tccaaagtgg tggctggaac actggtcatg acanaggcag tgactctgac
                                                                         240
tgangtc
                                                                         247
       <210> 168
       <211> 273
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (273)
      <223> n = A,T,C or G
      <400> 168
acttctaagt tttctagaag tggaaggatt gtantcatcc tgaaaatggg tttacttcaa
                                                                        ¨60
aatccctcan ccttgttctt cacnactgtc tatactgana gtgtcatgtt tccacaaagg
                                                                         120
getgacacet gageetgnat ttteacteat eeetgagaag eeettteeag tagggtggge
                                                                        180
aatteccaae tteettgeea caagetteee aggetttete eeetggaaaa etccagettg
                                                                        240
agtcccagat acactcatgg gctgccctgg gca
                                                                        273
      <210> 169
      <211>. 431
      <212> DNA .
      <213> Homo sapien-
      <220>
      <221> misc feature
      <222> (1)...(431)
      <223> n = A,T,C or G
      <400> 169
acageettgg ettecceaaa etccacagte teagtgeaga aagateatet tecageagte
                                                                         60
ageteagace agggteaaag gatgtgacat caacagttte tggttteaga acaggtteta
                                                                        120
ctactgtcaa atgacccccc atacttcctc aaaggctgtg gtaagttttg cacaggtgag
                                                                        180
ggcagcagaa agggggtant tactgatgga caccatcttc tctgtatact ccacactgac
                                                                        240
cttgccatgg gcaaaggccc ctaccacaaa aacaatagga tcactgctgg gcaccagctc
                                                                        300
acgcacatca ctgacaaccg ggatggaaaa agaantgcca actttcatac atccaactgg
                                                                        360
aaagtgatet gataetggat tettaattae etteaaaage ttetggggge cateagetge
                                                                        420
tcgaacactg a
                                                                        43Ì
      <210> 170
      <211> 266
      <212> DNA
     <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(266)
      \langle 223 \rangle n = A,T,C or G
```

```
<400> 170
acctgtgggc tgggctgtta tgcctgtgcc ggctgctgaa agggagttca gaggtggagc
                                                                        60
teaaggaget etgeaggeat tttgecaane etetecanag canagggage aacetacaet
                                                                       120
ccccgctaga aagacaccag attggagtcc tgggaggggg agttggggtg ggcatttgat
                                                                       180
gtatacttgt cacctgaatg aangagccag agaggaanga gacgaanatg anattggcct
                                                                       240
                                                                       266
tcaaagctag gggtctggca ggtgga
      <210> 171
      <211> 1248
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (1248)
      <223> n = A, T, C \text{ or } G
      <400> 171
ggcagccaaa tcataaacgg cgaggactgc agcccgcact cgcagccctg gcaggcggca
                                                                        60
ctggtcatgg aaaacgaatt gttctgctcg ggcgtcctgg tgcatccgca gtgggtgctg
                                                                       120
tragergear actittera gaagtgagtg cagageteet acaccategg getgggeetg
                                                                        180
cacagtettg aggeegacca agagecaggg agecagatgg tggaggecag ceteteegta
                                                                        240
cggcacccag agtacaacag accettgete getaacgace teatgeteat caagttggac
                                                                        300
gaatecgtgt ccgagtetga caccatecgg ageateagea ttgettegea gtgeeetace
                                                                       360
geggggaact cttgcctcgt ttctggctgg ggtctgctgg cgaacggcag aatgcctacc
                                                                        420
gtgctgcagt gcgtgaacgt gtcggtggtg tctgaggagg tctgcagtaa gctctatgac
                                                                        480
ccgctgtacc accccagcat gttctgcgcc ggcggagggc aagaccagaa ggactcctgc
                                                                        540
aacggtgact ctggggggcc cctgatctgc aacgggtact tgcagggcct tgtgtctttc
                                                                        600
ggaaaagccc cgtgtggcca agttggcgtg ccaggtgtct acaccaacct ctgcaaattc
                                                                        660
actgagtgga tagagaaaac cgtccaggcc agttaactct ggggactggg aacccatgaa
                                                                        720
attgacccc aaatacatcc tgcggaagga attcaggaat atctgttccc agcccctcct
                                                                        780
ceetcaggee caggagteca ggeecccage ceetcetece teaaaccaag ggtacagate
                                                                        840
cccagcccct cctccctcag acccaggagt ccagaccccc cagcccctcc tccctcagac
                                                                        900
ccaggagtcc agcccctcct ccctcagacc caggagtcca gacccccag ccctcctcc
                                                                        960
 cteagaceca ggggtecagg cececaacec etectecete agacteagag gtecaagece
                                                                       1020
 ccaaccente attecceaga eccagaggte caggteccag eccetentee etcagaceca
                                                                       1080
 geggtecaat gecacetaga etntecetgt acacagtgee ceettgtgge acgttgacee
                                                                       1140
 aaccttacca gttggttttt catttttngt ccctttcccc tagatccaga aataaagttt
                                                                       1200
 aagagaagng caaaaaaaaa aaaaaaaaa aaaaaaaaa
                                                                       1248
       <210> 172
       <211> 159.
       <212> PRT
       <213> Homo sapien
       <220>
       <221> VARIANT
       <222> (1)...(159)
       <223> Xaa = Any Amino Acid
       <400> 172
 Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro
 Leu Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser
                                  25
 Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr
```

Ala Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly

```
50
                         55
 Arg Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu
                                         75
Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe
Cys Ala Gly Gly Gln Xaa Gln Xaa Asp Ser Cys Asn Gly Asp Ser
                                 105
                                                    110
Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe
                             120
Gly Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn
                         135
                                             140
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                     150
      <210> 173
      <211> 1265
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (1265)
      <223> n = A,T,C or G
      <400> 173 -
ggcagecege actegeagee etggeaggeg geaetggtea tggaaaaega attgttetge
                                                                       60
togggcgtcc tggtgcatcc gcagtgggtg ctgtcagccg cacactgttt ccagaactcc
                                                                       120
tacaccatcg ggctgggcct gcacagtett gaggccgacc aagagccagg gagccagatg
                                                                       180
gtggaggcca gcctctccgt acggcaccca gagtacaaca gacccttgct cgctaacgac
                                                                       240
ctcatgctca tcaagttgga cgaatccgtg tccgagtctg acaccatccg gagcatcagc
                                                                       300
attgettege agtgeeetae egeggggaae tettgeeteg tttetggetg gggtetgetg
                                                                       360
gcgaacggtg agctcacggg tgtgtgtctg ccctcttcaa ggaggtcctc tgcccagtcg
                                                                       420
cgggggctga cccagagete tgcgteecag geagaatgee taccgtgctg cagtgegtga
                                                                       480
acgtgtcggt ggtgtctgag gaggtctgca gtaagctcta tgacccgctq taccaccca
                                                                       540
gcatgttetg egeeggegga gggcaagace agaaggacte etgeaaeggt gaetetgggg
                                                                       600
ggcccctgat ctgcaacggg tacttgcagg gccttgtgtc tttcggaaaa gccccgtgtg
                                                                       660
gccaagttgg cgtgccaggt gtctacacca acctctgcaa attcactgag tggatagaga
                                                                       720
aaaccgtcca ggccagttaa ctctggggac tgggaaccca tgaaattgac ccccaaatac
                                                                       780
atectgegga aggaatteag gaatatetgt teccageece tectecetea ggeecaggag
                                                                       840
tecaggeece cageceetee teceteaaac caagggtaca gateeceage eceteetee
                                                                      900
tragarreag gagteragar recreagers etectrones agarreagga gtragerer
                                                                      960
tecteentea gacceaggag tecagacece ecagececte eteceteaga eccaggggtt
                                                                      1020
gaggececca acceetecte etteagagte agaggtecaa gececeaace cetegttece
                                                                      1080
cagacccaga ggtnnaggtc ccagcccctc ttccntcaga cccagnggtc caatgccacc
                                                                      1140
tagattttcc ctgnacacag tgcccccttg tggnangttg acccaacctt accagttggt
                                                                      1200
ttttcatttt tngtcccttt cccctagatc cagaaataaa gtttaagaga ngngcaaaaa
                                                                     1260
aaaaa
                                                                     1265
     .<210> 174
      <211> 1459
      <212> DNA
      <213> Homo sapien
     <220>
```

<221> misc_feature <222> (1)...(1459) <223> n = A,T,C or G

```
<400> 174
ggtcagccgc acactgtttc cagaagtgag tgcagagctc ctacaccatc gggctgggcc
                                                                        60
tgcacagtct tgaggccgac caagagccag ggagccagat ggtggaggcc agcetetecg
                                                                       120
tacggcaccc agagtacaac agaccettge tegetaacga ceteatgete atcaagttgg
                                                                       180
acgaatccgt greegagtet gacaccatec ggagcatcag cattgetteg cagtgeecta
                                                                       240
cegeggggaa ctettgeete gtttetgget ggggtetget ggegaaeggt gageteaegg
                                                                       300
gtgtgtgtct gccctcttca aggaggtcct ctgcccagtc gcgggggctg acccagagct
                                                                       360
ctgcgtccca ggcagaatge ctaccgtgct gcagtgcgtg aacgtgtcgg tggtgtctga
                                                                       420
ngaggtetge antaagetet atgacceget gtaccacece ancatgttet gegeeggegg
                                                                       480
agggcaagac cagaaggact cctgcaacgt gagagagggg aaaggggagg gcaggcgact
                                                                       540
cagggaaggg tggagaaggg ggagacagag acacacaggg ccgcatggcg agatgcagag
                                                                       600
atggagagac acacagggag acagtgacaa ctagagagag aaactgagag aaacagagaa
                                                                       660
ataaacacag gaataaagag aagcaaagga agagagaaac agaaacagac atggggaggc
                                                                       720
agaaacacac acacatagaa atgcagttga cettecaaca gcatggggcc tgagggcggt
                                                                       780
gacetecace caatagaaaa teetettata aettttgaet eeccaaaaae etgactagaa
                                                                       840
atageetaet gttgaegggg ageettaeea ataacataaa tagtegattt atgeataegt
                                                                        900
tttatgcatt catgatatac ctttgttgga attttttgat atttctaagc tacacagttc
                                                                       960
gtctgtgaat ttttttaaat tgttgcaact ctcctaaaat ttttctgatg tgtttattga
                                                                       1020
aaaaatccaa gtataagtgg acttgtgcat tcaaaccagg gttgttcaag ggtcaactgt
                                                                      1080
gtacccagag ggaaacagtg acacagattc atagaggtga aacacgaaga gaaacaggaa
                                                                      1140
aaatcaagac tctacaaaga ggctgggcag ggtggctcat gcctgtaatc ccagcacttt
                                                                      1200
gggaggcgag gcaggcagat cacttgaggt aaggagttca agaccagcet ggccaaaatg
                                                                       1260
gtgaaateet gtetgtaeta aaaatacaaa agttagetgg atatggtgge aggegeetgt
                                                                       1320
aatcccagct acttgggagg ctgaggcagg agaattgctt gaatatggga ggcagaggtt
                                                                       1380
gaagtgagtt gagatcacac cactatactc cagctggggc aacagagtaa gactctgtct
                                                                       1440
                                                                       1459
 caaaaaaaa aaaaaaaaa
       <210> 175
       <211> 1167
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(1167)
       <223> n = A, T, C or G
 gegeageest ggeaggegge actggteatg gaaaacgaat tgttetgete gggegteetg
                                                                         60
 gtgcatccgc agtgggtgct gtcagccgca cactgtttcc agaactccta caccatcggg
                                                                        120
 ctgggcctgc acagtcttga ggccgaccaa gagccaggga gccagatggt ggaggccagc
                                                                        180
 ctctccgtac ggcacccaga gtacaacaga ctcttgctcg ctaacgacct catgctcatc
                                                                        240
 aagttggacg aatccgtgte cgagtetgac accatecgga gcateageat tgettegeag
                                                                        300
 tgccctaccg cggggaactc ttgcctcgtn tctggctggg gtctgctggc gaacggcaga
                                                                        360
 atgectaccg tgctgcactg cgtgaacgtg teggtggtgt ctgaggangt ctgcagtaag
                                                                        420
 ctctatgacc cgctgtacca ccccagcatg ttctgcgccg gcggagggca agaccagaag
                                                                        480
 gacteetgea aeggtgacte tggggggeee etgatetgea aegggtaett geagggeett
                                                                        540
 gtgtctttcg gaaaagcccc gtgtggccaa cttggcgtgc caggtgtcta caccaacctc
                                                                         600
 tgcaaattca ctgagtggat agagaaaacc gtccagncca gttaactctg gggactggga
                                                                         660
 acccatgaaa ttgacccca aatacateet geggaangaa tteaggaata tetgtteeca
                                                                         720
 gecetecte ceteaggee aggagtecag gececeagee ceteetecet caaaccaagg
                                                                         780
 gtacagatcc ccagcccctc etccctcaga cccaggagtc cagacccccc agcccctcnt
                                                                         840
 centeagace caggagteca gecetecte enteagacge aggagtecag accececage
                                                                         900
  cententeeg teagacecag gggtgeagge ecceaacece tenteentea gagteagagg
                                                                         960
  tecaageece caaceceteg ttececagae ccagaggtne aggteccage cectecteec
                                                                        1020
 teagacecag eggteeaatg ceacetagan tntceetgta cacagtgeec cettgtggea
                                                                        1080
 ngttgaccca accttaccag ttggtttttc attttttgtc cctttcccct agatccagaa
                                                                        1140
```

ataaagtnta agagaagcgc aaaaaaa

<210> 176

```
<211> 205
       <212> PRT
       <213> Homo sapien
       <220>
       <221> VARIANT
       <222> (1)...(205)
       <223> Xaa = Any Amino Acid
       <400> 176
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
                                 25
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Leu Leu Leu
                        55
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
                     70
                                         75
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
                 85
                                     90
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg Met
                                 105
Pro Thr Val Leu His Cys Val Asn Val Ser Val Val Ser Glu Xaa Val
Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys Ala
                         135
Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly Gly
                    150
                                         155
Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly Lys
                                     170
Ala Pro Cys Gly Gln Leu Gly Val Pro Gly Val Tyr Thr Asn Leu Cys
                                185
Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Xaa Ser
        195
      <210> 177
      <211> 1119
      <212> DNA
      <213> Homo sapien
      <400> 177
gegeactege agecetggea ggeggeactg gteatggaaa acgaattgtt etgeteggge
                                                                        60
gtcctggtgc atccgcagtg ggtgctgtca gccgcacact gtttccagaa ctcctacacc
                                                                       120
ategggetgg geetgeacag tettgaggee gaccaagage cagggageca gatggtggag
                                                                       180
gecageetet cegtaeggea eccagagtae aacagaeeet tgetegetaa egaceteatg
                                                                       240
ctcatcaagt tggacgaatc cgtgtccgag tctgacacca tccggagcat cagcattgct
                                                                       300
tegeagtgee ctacegeggg gaactettge etegtttetg getggggtet getggegaac
                                                                       360
gatgetgtga ttgccatcca gtcccagact gtgggaggct gggagtgtga gaagetttcc
                                                                       420
caaccctggc agggttgtac catttcggca acttccagtg caaggacgtc ctgctgcatc
                                                                       480
ctcactgggt gctcactact gctcactgca tcacccggaa cactgtgatc aactagccag
                                                                       540
caccatagtt ctccgaagtc agactatcat gattactgtg ttgactgtgc tgtctattgt
                                                                       600
actaaccatg ccgatgttta ggtgaaatta gcgtcacttg gcctcaacca tcttggtatc
                                                                       660
cagttateet caetgaattg agattteetg etteagtgte agecatteee acataattte
                                                                       720
tgacctacag aggtgaggga tcatataget ettcaaggat getggtacte ceetcacaaa
                                                                       780
```

```
tteatttete etgttgtagt gaaaggtgeg eeetetggag eeteecaggg tgggtgtgea
                                                                      840
ggtcacaatg atgaatgtat gatcgtgttc ccattaccca aagcctttaa atccctcatg
                                                                      900
ctcagtacac cagggcaggt ctagcatttc ttcatttagt gtatgctgtc cattcatgca
                                                                      960
accaceteag gacteetgga ttetetgeet agttgagete etgeatgetg eeteettggg
                                                                    1020
gaggtgaggg agagggccca tggttcaatg ggatctgtgc agttgtaaca cattaggtgc
                                                                     1080
                                                                     1119
ttaataaaca gaagetgtga tgttaaaaaa aaaaaaaaa
      <210> 178
      <211> 164
      <212> PRT
      <213> Homo sapien
      <220>
      <221> VARIANT
      <222> (1) . . . (164)
      <223> Xaa = Any Amino Acid
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
      <400> 178
                                    10
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
                                    25
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
                            40
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu Leu
                                            60
 Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
                         55
                     70
 Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
                                    90
                 85
 Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Asp Ala Val
                                 105
            . 100
 Ile Ala Ile Gln Ser Xaa Thr Val Gly Gly Trp Glu Cys Glu Lys Leu
                             120
 Ser Gln Pro Trp Gln Gly Cys Thr Ile Ser Ala Thr Ser Ser Ala Arg
         115
                                             140
                         135
 Thr Ser Cys Cys Ile Leu Thr Gly Cys Ser Leu Leu Thr Ala Ser
                                         155
 Pro Gly Thr Leu
       <210> 179
       <211> 250
       <212> DNA
        <213> Homo sapien
       <400> 179
  ctggagtgcc ttggtgtttc aagcccctgc aggaagcaga atgcaccttc tgaggcacct
                                                                        60
  ccagctgccc ccggccgggg gatgcgaggc tcggagcacc cttgcccggc tgtgattgct
                                                                        120
  gecaggeact gtteatetea gettttetgt ecetttgete eeggeaageg ettetgetga
                                                                        180
  aagttcatat ctggagcctg atgtcttaac gaataaaggt cccatgctcc acccgaaaaa
                                                                        240
                                                                        250
  aaaaaaaaaa
        <210> 180
        <211> 202
        <212> DNA
        <213> Homo sapien
```

```
<400> 180
 actagtocag tgtggtggaa ttccattgtg ttgggcccaa cacaatggct acctttaaca
                                                                          60
 teacceagae eccgeceetg eccgtgeece acgetgetge taacgacagt atgatgetta
                                                                         120
 ctctgctact cggaaactat ttttatgtaa ttaatgtatg ctttcttgtt tataaatgcc
                                                                         180
 tgatttaaaa aaaaaaaaaa aa
                                                                         202
       <210> 181
       <211> 558
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) . . . (558)
       <223> n = A, T, C or G
       <400> 181
 tecytttgkt naggtttkkg agacameeck agacetwaan etgtgteaca gaetteyngg
                                                                         60
 aatgtttagg cagtgctagt aatttcytcg taatgattct gttattactt tcctnattct
                                                                        120
 ttatteetet ttettetgaa gattaatgaa gttgaaaatt gaggtggata aatacaaaaa
                                                                        180
 ggtagtgtga tagtataagt atctaagtgc agatgaaagt gtgttatata tatccattca
                                                                        240
 aaattatgca agttagtaat tactcagggt taactaaatt actttaatat gctgttgaac
                                                                        300
 ctactctgtt ccttggctag aaaaaattat aaacaggact ttgttagttt gggaagccaa
                                                                        360
 attgataata ttctatgttc taaaagttgg gctatacata aattattaag aaatatggaw
                                                                        420
 ttttattccc aggaatatgg kgttcatttt atgaatatta cscrggatag awgtwtgagt
                                                                        480
 aaaaycagtt ttggtwaata ygtwaatatg tcmtaaataa acaakgcttt gacttatttc.
                                                                        540
caaaaaaaa aaaaaaaa
                                                                        558
       <210> 182
       <211> 479
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(479)
      <223> n = A,T,C or G
      <400> 182
acagggwttk grggatgeta agseccerga rwtygtttga tecaaccetg gettwtttte
                                                                         60
agaggggaaa atggggccta gaagttacag mscatytagy tggtgcgmtg gcaccctgg
                                                                        120
esteacacag astecegagt agetgggact acaggcacac agtcactgaa geaggccetg
                                                                        180
ttwgcaattc acgttgccac ctccaactta aacattcttc atatgtgatg tccttagtca
                                                                       240
ctaaggttaa actttcccac ccagaaaagg caacttagat aaaatcttag agtactttca
                                                                       300
tactmttcta agtcctcttc cagcctcact kkgagtcctm cytgggggtt gataggaant
                                                                       360
ntctcttggc tttctcaata aartctctat ycatctcatg tttaatttgg tacgcatara
                                                                       420
awtgstgara aaattaaaat gttctggtty mactttaaaa araaaaaaaa aaaaaaaaa
                                                                       479
      <210> 183
      <211> 384
      <212> DNA
      <213> Homo sapien
      <400> 183
aggcgggage agaagetaaa gecaaageee aagaagagtg geagtgeeag eactggtgee
                                                                        60
agtaccagta ccaataacag tgccagtgcc agtgccagca ccagtggtgg cttcagtgct
                                                                       120
ggtgccagcc tgaccgccac tctcacattt gggctcttcg ctggccttgg tggagctggt
                                                                       180
gccagcacca gtggcagctc tggtgcctgt ggtttctcct acaagtgaga ttttagatat
                                                                       240
```

, 8			not nagazac	chactcaaca	300
tgttaatcct gccagtcttt	ctcttcaagc	cagggtgcat	cultagaaac	aratatatet	360
cagcactcta ggcagccact	atcaatcaat	tgaagttgac	actotgoatt	aracctacce	
gccatttcaa aaaaaaaaa	aaaa				384
-gccacoco-	*. ,				
<210> 184		4			
· · · · · · · · · · · · · · · · · · ·		8			
<211> 496	Y				
<212> DNA					
<213> Homo sapi	en				
<220>		1 1 2 0		* , *	
<221> misc_feat	ure				
<222> (1) (49					
$\langle 223 \rangle \ n = A, T, C$					
(223) II - A,1,0	0 2				
<400> 184		tastationt	ccrotatkac	ctcaacgage	60
accgaattgg gaccgctggc	ttataagega	ccacgcyync	aaaaaaaaaa	acctdctcad	120
	. ~+~~~~~	rroacccual	uuuacaacaa	accegooos.	180
		AACACLCCSM	acaccquacc		240
					300
					360
					420
ttttctcat attttaaatt	- codesgraga	tattwmagaw	waaatqawtt	gaaaaactst	480
Effectat accuadact	, accaciiaga.				496
taaaaaaaaa aaaaaa		والمراجع والمراجع			
<210> 185	**			A to	
<211> 384					
<212> DNA					
<213> Homo sap	ien			1	æ_
		4.			
<400> 185				*	
	ccacagag	ggeteetgag	gccacggrad	agtgacttcc	60
					120
		' acaucaacu	4 700400444	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	180
					240
gggcacaccc tectggggc tggtgctgct cctcgtcat	e caggeggge	tooccaaca!	cctactaat	aacttqctca	300
tggtgctgct cctcgtcat	e rrecigere	- toggeedaea	e carroatoto	tactoggaag	360
ttgccatgtt cagttacac	a ttcggcaaa	g tacagggca	cagegacee		384
gcgcagcgtt accgcctca	t ccgg		<i>i</i> *		
			* 4.		
<210> 186	X	*	4.1	*	* e - 21.
<211> 577					
<212> DNA				100	
<213> Homo sap	ien				
CZIS HOMO Sap		1.5			
	e de grande de	a a server of a server	1 V		
<220>	and the second second		199	eren a e major	
<221> misc_fea				,	
<222> (1) (5	77)				
$\langle 223 \rangle n = A, T,$	C or G				•
	•				
<400> 186					
	c ttgatgagg	t cgtctgcag	t ggcctctcg	c ttcataccgc	60
	**	a cveceluuu	a ccccyyyy	g	
ccaggaaact ctcaatcaa	s topocotco	a tgaaacctg	t agactaatt	c tgtcttccgc	180
ccaggaaact ctcaatcaa	y coaccyccy	a otocotott	c ccacactt	t tgatgacttt	240
	TORDDEENE. A	a cicuatici	,c cccacaee	• • • • • • • • • • • • • • • • • • • •	
	++ ccatcadda	or orthoroxida	id Crereade	·	
	ta meataccaa	a darcaccya	14 666696969	3 33333·	
	AASMAMAME	'C GCGGCaaaa	lu acattyacu	.a accegetes	
gtggaaaaag amcamctc	t ggargtgct	n geegeteet	c gtcmgttgg	t ggcagcgctw	480
aranara america		. – –			

```
tccttttgac acacaaacaa gttaaaggca ttttcagccc ccagaaantt gtcatcatcc
                                                                         540
aagatntcgc acagcactna tccagttggg attaaat
                                                                         577
       <210>, 187
       <211> 534
       <212> DNA
       <213> Homo sapien
       <220>
      <221> misc_feature
       <222> (1)...(534)
       \langle 223 \rangle n = A,T,C or G
       <400> 187
aacatcttcc tgtataatgc tgtgtaatat cgatccgatn ttgtctgstg agaatycatw
                                                                          60
actkggaaaa gmaacattaa agcctggaca ctggtattaa aattcacaat atgcaacact
                                                                         120
ttaaacagtg tgtcaatctg ctcccyynac tttgtcatca ccagtctggg aakaagggta
                                                                         180
tgccctattc acacetgtta aaagggeget aagcattttt gattcaacat etttttttt
                                                                         240
gacacaagtc cgaaaaaagc aaaagtaaac agttatyaat ttgttagcca attcactttc
                                                                         300
ttcatgggac agagccatyt gatttaaaaa gcaaattgca taatattgag cttygggagc
                                                                         360
tgatatttga gcggaagagt agcettteta etteaceaga cacaacteee ttteatattg
                                                                         420
ggatgttnac naaagtwatg tetetwacag atgggatget tttgtggcaa ttetgttetg
                                                                         480
aggatetece agtttattta ceaettgeae aagaaggegt tttetteete agge
                                                                         534
      <210> 188
      <211> 761
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (761)
      <223> n = A, T, C or G
      <400> 188
agaaaccagt atctctnaaa acaacctctc ataccttgtg gacctaattt tgtgtgcgtg
                                                                         60
tgtgtgtgcg cgcatattat atagacaggc acatcttttt tacttttgta aaagcttatg
                                                                        120
cetetttggt atetatatet gtgaaagttt taatgatetg ceataatgte ttggggaeet
                                                                        180
ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagttngt*
                                                                        240
tttattcgac atgaaggaaa tttccagatn acaacactna caaactctcc ctkgackarg
                                                                        300
ggggacaaag aaaagcaaaa ctgamcataa raaacaatwa cctggtgaga arttgcataa
                                                                        360
acagaaatwr ggtagtatat tgaarnacag catcattaaa rmgttwtktt wttctccctt
                                                                        420
gcaaaaaaca tgtacngact teeegttgag taatgecaag ttgttttttt tatnataaaa
                                                                        480
cttgcccttc attacatgtt tnaaagtggt gtggtgggcc aaaatattga aatgatggaa
                                                                        540
ctgactgata aagctgtaca aataagcagt gtgcctaaca agcaacacag taatgttgac
                                                                        600
atgettaatt cacaaatget aattteatta taaatgtttg etaaaataca etttgaacta
                                                                        660
tttttctgtn ttcccagagc tgagatntta gattttatgt agtatnaagt gaaaaantac
                                                                        720
gaaaataata acattgaaga aaaananaaa aaanaaaaaa a
                                                                        761
      <210> 189
      <211> 482
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) . . . (482)
      <223> n = A,T,C or G
```

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```
<400> 189 -
ttttttttt tttgccgatn ctactatttt attgcaggan gtgggggtgt atgcaccgca
                                                                        60
caccggggct atnagaagca agaaggaagg agggagggca cagccccttg ctgagcaaca
                                                                       120
aageegeetg etgeettete tgtetgtete etggtgeagg cacatgggga gacetteece
                                                                        180
aaggcagggg ccaccagtcc aggggtggga atacaggggg tgggangtgt gcataagaag
                                                                        240
tgataggeac aggecacceg gtacagacce eteggeteet gacaggtnga tttegaccag
                                                                        300
gtcattgtgc cctgcccagg cacagcgtan atctggaaaa gacagaatgc tttccttttc
                                                                        360
aaatttggct ngtcatngaa ngggcanttt tccaanting gcinggtcit ggtacncttg
                                                                        420
gtteggeeca geteenegte caaaaantat teaccennet cenaattget tgenggneec
                                                                        480
                                                                        482
      <210> 190
      <211> 471
      <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (471):
     <223>n = A,T,C.or.G.
ttttttttt ttttaaaaca gtttttcaca acaaaattta ttagaagaat agtggttttg
                                                                         60.
agaacteteg catecagtga gaactaccat acaccacatt acagetngga atgineteca
                                                                        120
aatgtctggt caaatgatac aatggaacca ttcaatctta cacatgcacg aaagaacaag
                                                                        180
 cgcttttgac atacaatgca caaaaaaaa agggggggg gaccacatgg attaaaattt
                                                                        240
 taagtactca tcacatacat taagacacag ttctagtcca gtcnaaaatc agaactgcnt
 tgaaaaattt catgtatgca atccaaccaa agaacttnat tggtgatcat gantnctcta
                                                                        360
 ctacatenae ettgateatt gecaggaaen aaaagttnaa ancaenengt acaaaaanaa
                                                                        420
 tetgtaattn antteaacet eegtaengaa aaatnttnnt tatacaetee e
                                                                        471
       <210> 191
       <211> 402
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (402)
       <223> n = A, T, C \text{ or } G
       <400>'191
 gagggattga aggtctgttc tastgtcggm ctgttcagcc accaactcta acaagttgct
                                                                          60
 gtcttccact cactgtctgt aagcttttta acccagacwg tatcttcata aatagaacaa
                                                                         120
 attetteace agreacatet tetaggacet ttttggatte agrtagtata agetetteca
                                                                         180
 etteettigt taagaettea tetggtaaag tettaagtit tgtagaaagg aattyaattg
                                                                         240
 ctegttetet aacaatgtee teteettgaa gtatttgget gaacaaceca cetaaagtee
                                                                         300
 ctttgtgcat ccattttaaa tatacttaat agggcattgk tncactaggt taaattctgc
                                                                         360
 aagagtcatc tgtctgcaaa agttgcgtta gtatatctgc ca
        <210> 192
        <211> 601
        <212> DNA
        <213> Homo sapien
        <220>
        <221> misc_feature
```

```
<222> (1)...(601)
       \langle 223 \rangle n = A,T,C or G
       <400> 192
gageteggat ecaataatet ttgtetgagg geageacaea tatneagtge catggnaact
                                                                         60
ggtctacccc acatgggage agcatgccgt agntatataa ggtcattccc tgagtcagac
                                                                         120
atgcytyttt gaytaccgtg tgccaagtgc tggtgattct yaacacacyt ccatcccgyt
                                                                         180
cttttgtgga aaaactggca cttktctgga actagcarga catcacttac aaattcaccc
                                                                         240
acgagacact tgaaaggtgt aacaaagcga ytcttgcatt gctttttgtc cctccggcac
                                                                         300
cagttgtcaa tactaacccg ctggtttgcc tccatcacat ttgtgatctg tagctctgga
                                                                         360
tacateteet gacagtactg aagaacttet tettttgttt caaaageare tettqqtqce
                                                                         420
tgttggatca ggttcccatt tcccagtcyg aatgttcaca tggcatattt wacttcccac
                                                                         480
aaaacattgc gatttgaggc tcagcaacag caaatcctgt tccggcattg gctgcaagag
                                                                         540
cetegatgta geeggeeage geeaaggeag gegeegtgag eeccaceage ageagaagea
                                                                         600
                                                                         601
      <210> 193
       <211> 608
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(608)
      <223> n = A, T, C \text{ or } G
      <400> 193
atacagecea nateceacea egaagatgeg ettgttgaet gagaacetga tgeggteaet
                                                                         .60
ggtcccgctg tagccccagc gactctccac ctgctggaag cggttgatgc tgcactcytt
                                                                        120
cccaacgcag gcagmagcgg gsccggtcaa tgaactccay tcgtggcttg gggtkgacgg
                                                                        180
tkaagtgcag gaagaggetg accaeetege ggteeaeeag gatgeeegae tgtgegggae
                                                                        240
ctgcagcgaa actcctcgat ggtcatgagc gggaagcgaa tgaggcccag ggccttgccc
                                                                        300
agaacettee geetgttete tggegteace tgeagetget geegetgada eteggeeteg
                                                                        360
gaccagegga caaaeggert tgaacageeg caceteaegg atgeecagtg tgtegegete
                                                                        420
caggammgsc accagegtgt ccaggteaat gteggtgaag cccteegegg gtratggegt
                                                                        480
ctgcagtgtt tttgtcgatg ttctccaggc acaggctggc cagctgcggt tcatcgaaga
                                                                        540
gtcgcgcctg cgtgagcagc atgaaggcgt tgtcggctcg cagttettet tcaggaacte
                                                                        600
cacgcaat
                                                                        608
      <210> 194
      <211> 392
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(392)
      <223> n = A,T,C or G
      <400> 194
gaacggctgg accttgcctc gcattgtgct tgctggcagg gaataccttg gcaagcagyt
                                                                         60
ccagtccgag cagccccaga ccgctgccgc ccgaagctaa gcctgcctct ggccttcccc
                                                                        120
teegeeteaa tgeagaacea gtagtgggag eactgtgttt agagttaaga gtgaacactg
                                                                        180
tttgatttta ettgggaatt teetetgtta tatagetttt eecaatgeta attteeaaae
                                                                        240
aacaacaaca aaataacatg tttgcctgtt aagttgtata aaagtaggtg attctgtatt
                                                                        300
taaagaaaat attactgtta catatactgc ttgcaatttc tgtatttatt gkinctstgg
                                                                        360
aaataaatat agttattaaa ggttgtcant cc
                                                                        392
```

```
<210> 195
      <211> 502
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (502)
      <223> n = A,T,C \text{ or } G
      <400> 195
ccsttkgagg ggtkaggkyc cagttyccga gtggaagaaa caggccagga gaagtgcgtg
cegagetgag geagatgtte ceacagtgae ecceagagee stgggstata gtytetgace
                                                                       120
cetencaagg aaagaccaes ttetggggae atgggetgga gggcaggaee tagaggeaee
aagggaaggc cccattccgg ggstgttccc cgaggaggaa gggaaggggc tctgtgtgcc
                                                                         240
ccccasgagg aagaggccct gagtcctggg atcagacacc ccttcacgtg tatccccaca
                                                                         300
caaatgcaag ctcaccaagg tcccctctca gtccccttcc stacaccctg amcggccact
                                                                         360
gsescacace cacceagage acgecacceg ceatggggar tgtgetcaag gartegengg
                                                                         420
gcarcgtgga catctngtcc cagaaggggg cagaatctcc aatagangga ctgarcmstt
                                                                         480
                                                                         502
gctnanaaaa aaaaanaaaa aa
       <210> 196
     <211> 665
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (665)
       \langle 223 \rangle n = A,T,C or G
       <400> 196
 ggttacttgg tttcattgcc accacttagt ggatgtcatt tagaaccatt ttgtctgctc
                                                                          - 60
 cetetggaag cettgegeag ageggaettt gtaattgttg gagaataact getgaatttt
                                                                         120
 wagetgtttk gagttgatts geaccactge acceacaact teaatatgaa aacyawttga
                                                                         180
 actwatttat tatcttgtga aaagtataac aatgaaaatt ttgttcatac tgtattkatc
                                                                         240
 aagtatgatg aaaagcaawa gatatatatt cttttattat gttaaattat gattgccatt
                                                                          300
 attaategge aaaatgtgga gtgtatgtte ttttcacagt aatatatgee ttttgtaact
                                                                          360
 teacttggtt attttattgt aaatgartta caaaattett aatttaagar aatggtatgt
                                                                          420
 watatttatt tcattaattt ctttcctkgt ttacgtwaat tttgaaaaga wtgcatgatt
                                                                          480
 tettgacaga aategatett gatgetgtgg aagtagtttg acceacatee etatgagttt
                                                                          540
 ttettagaat gtataaaggt tgtageeeat enaactteaa agaaaaaaat gaceacatae
                                                                          600
 tttgcaatca ggctgaaatg tggcatgctn ttctaattcc aactttataa actagcaaan
                                                                          660
 aagtg /
       <210> 197
        <211> 492
        <212> DNA
        <213> Homo sapien
        <220>
        <221> misc_feature
       <222> (1) ... (492)
        <223> n = A, T, C or G
  ttttnttttt tttttttgc aggaaggatt ccatttattg tggatgcatt ttcacaatat
                                                                           60 <sup>11</sup>
  atgtttattg gagcgatcca ttatcagtga aaagtatcaa gtgtttataa natttttagg
                                                                          120
```

```
aaggcagatt cacagaacat gctngtcngc ttgcagtttt acctcgtana gatnacagag
                                                                       . 180
aattatagtc naaccagtaa acnaggaatt tacttttcaa aagattaaat ccaaactgaa
                                                                        240
caaaattcta ccctgaaact tactccatcc aaatattgga ataanagtca gcagtgatac
                                                                        300
attetettet gaaetttaga ttttetagaa aaatatgtaa tagtgateag gaagagetet
                                                                        360
tgttcaaaag tacaacnaag caatgttccc ttaccatagg ccttaattca aactttgatc
                                                                        420
cattleacte ceateacggg agteaatget acetgggaca ettgtatttt gtteatnetg
                                                                        480
ancntggctt aa
                                                                        492
      <210> 198
      <211> 478
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(478)
      <223> n = A,T,C or G
      <400> 198
tttnttttgn atttcantct gtannaanta ttttcattat gtttattana aaaatatnaa
                                                                        60
tgtntccacn acaaatcatn ttacntnagt aagaggccan ctacattgta caacatacac
                                                                        120
tgagtatatt ttgaaaagga caagtttaaa gtanacncat attgccganc atancacatt
                                                                        180
tatacatggc ttgattgata tttagcacag canaaactga gtgagttacc agaaanaaat
                                                                        240
natatatgic aatongatti aagatacaaa acagatocta tggtacatan catontgtag
                                                                        300
gagttgtggc tttatgttta ctgaaagtca atgcagttcc tgtacaaaga gatggccgta
                                                                       360
agcattctag tacctctact ccatggttaa gaatcgtaca cttatgttta catatgtnca
                                                                        420
gggtaagaat tgtgttaagt naanttatgg agaggtccan gagaaaaatt tgatncaa
                                                                       478
      <210> 199
      <211> 482
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature:
      <222> (1)...(482)
      <223> n = A, T, C or G
      <400> 199
agtgacttgt cctccaacaa aaccccttga tcaagtttgt ggcactgaca atcagaccta
                                                                        60
tgctagttcc tgtcatctat tcgctactaa atgcagactg gaggggacca aaaaggggca
                                                                       120
tcaactccag ctggattatt ttggagcctg caaatctatt cctacttgta cggactttga
                                                                       180
agtgattcag tttcctctac ggatgagaga ctggctcaag aatatcctca tgcagcttta
                                                                       240
tgaageenae tetgaacaeg etggttatet nagatgagaa neagagaaat aaagtenaga
                                                                       300
aaatttacct ggangaaaag aggetttngg etggggacca teccattgaa eettetetta
                                                                       360
anggacttta agaanaaact accacatgtn tgtngtatcc tggtgccngg ccgtttantg
                                                                       420
aachtngach neaccettht ggaatanant ettgachgen teetgaactt geteetetge
                                                                       480
                                                                       482
     <210> 200
     <211> 270
     <212> DNA
     <213> Homo sapien
     <220>
     <221> misc_feature
     <222> (1)...(270)
     <223> n = A,T,C or G
```

```
<400> 200
cggccgcaag tgcaactcca gctggggccg tgcggacgaa gattctgcca gcagttggtc
                                                                      60
egactgegae gaeggeggeg gegacagteg caggtgeage gegggegeet ggggtettge
                                                                     120
aaggetgage tgaegeegea gaggtegtgt caegteeeae gaeettgaeg eegtegggga
                                                                     180
cageeggaac agageeggt gaangeggga ggeetegggg ageeetegg gaagggegge
                                                                     240
ccgagagata cgcaggtgca ggtggccgcc
      <210> 201
      <211> 419
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (419)
      <223> n = A, T, C \text{ or } G
ttttttttt ttttggaate tactgegage acageaggte ageaacaagt ttattttgea
      <400> 201
gctagcaagg taacagggta gggcatggtt acatgttcag gtcaacttcc tttgtcgtgg
                                                                      120
ttgattggtt tgtctttatg ggggcggggt ggggtagggg aaancgaagc anaantaaca
                                                                      180
tggagtgggt gcaccetece tgtagaacet ggttaenaaa gettggggea gtteacetgg
                                                                      240
tetgtgaceg teattttett gacateaatg ttattagaag teaggatate ttttagagag
                                                                      300
tocactgint ciggagggag attagggitt citgccaana tocaancaaa atccacniga
                                                                      360
aaaagttgga tgatncangt acngaatacc ganggcatan ttctcatant cggtggcca
                                                                      419
      <210> 202
       <211> 509
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) ... (509)
       <223> n = A, T, C or G
       <400> 202
 tggcacttaa tccattttta tttcaaaatg tctacaaant ttnaatncnc cattatacng
                                                                      120
 gtnattttnc aaaatctaaa nnttattcaa atntnagcca aantccttac ncaaatnnaa
                                                                      180
 tacncncaaa aatcaaaaat atacntntct ttcagcaaac ttngttacat aaattaaaaa
                                                                      240
 aatatatacg getggtgttt tcaaagtaca attatettaa caetgeaaac atntttnnaa
                                                                      300
 ggaactaaaa taaaaaaaaa cactnoogca aaggttaaag ggaacaacaa attontttta
 caacanenne nattataaaa atcatatete aaatettagg ggaatatata etteacaeng
                                                                     . 420
 ggatettaac ttttactnea etttgtttat ttttttanaa ecattgtntt gggeecaaca
                                                                       480
                                                                       509
 caatggnaat necncenene tggactagt
        <210> 203
        <211> 583
        <212> DNA
        <213> Homo sapien
        <220>
        <221> misc_feature
        <222> (1) . . . (583)
        <223> n = A,T,C or G
```

```
<400> 203
 ttttttttt tttttttga cccccctctt ataaaaaaca agttaccatt ttattttact
                                                                         60
 tacacatatt tattttataa ttggtattag atattcaaaa ggcagctttt aaaatcaaac
                                                                        120
 taaatggaaa ctgccttaga tacataattc ttaggaatta gcttaaaatc tgcctaaagt
                                                                        180
 gaaaatcttc tctagctctt ttgactgtaa atttttgact cttgtaaaac atccaaattc
                                                                        240
 atttttcttg tctttaaaat tatctaatct ttccattttt tccctattcc aagtcaattt
                                                                        300
 gettetetag ceteatitee tagetettat etactattag taagtggett titteetaaa
                                                                        360
 agggaaaaca ggaagagana atggcacaca aaacaaacat tttatattca tatttctacc
                                                                        420
 tacgttaata aaatagcatt ttgtgaagcc agctcaaaag aaggcttaga tccttttatg
                                                                        480
 tecattttag teactaaacg atatenaaag tgecagaatg caaaaggttt gtgaacattt
                                                                        540
 attcaaaagc taatataaga tatttcacat actcatcttt ctg
                                                                        583
       <210> 204
       <211> 589
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (589)
       <223> n = A, T, C or G
      <400> 204
ttttttttt tttttttt tttttttccc ttctttttt ttganaatga ggatcgagtt
tttcactctc tagatagggc atgaagaaaa ctcatctttc cagctttaaa ataacaatca
                                                                        120
aatetettat getatateat attttaagtt aaaetaatga gteaetgget tatettetee
                                                                        180
tgaaggaaat ctgttcattc ttctcattca tatagttata tcaagtacta ccttgcatat
                                                                        240
tgagaggttt ttcttctcta tttacacata tatttccatg tgaatttgta tcaaaccttt
                                                                        300
attttcatgc aaactagaaa ataatgtntt cttttgcata agagaagaga acaatatnag
                                                                       360
cattacaaaa ctgctcaaat tgtttgttaa gnttatccat tataattagt tnggcaggag
                                                                       420
ctaatacaaa tcacatttac ngacnagcaa taataaaact gaagtaccag ttaaatatcc
                                                                       480
aaaataatta aaggaacatt tttagcctgg gtataattag ctaattcact ttacaagcat
                                                                       540
ttattnagaa tgaattcaca tgttattatt ccntagccca acacaatgg
                                                                       589
      <210> 205
      <211> 545
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (545)
      <223> n = A, T, C or G
      <400> 205
tttttntttt tttttcagt aataatcaga acaatattta tttttatatt taaaattcat
                                                                        60
agaaaagtgc cttacattta ataaaagttt gtttctcaaa gtgatcagag gaattagata
                                                                       120
tngtcttgaa caccaatatt aatttgagga aaatacacca aaatacatta agtaaattat
                                                                       180
ttaagatcat agagettgta agtgaaaaga taaaatttga eetcagaaac tetgageatt
                                                                       240
aaaaatccac tattagcaaa taaattacta tggacttctt gctttaattt tgtgatgaat
                                                                       300
atggggtgtc actggtaaac caacacattc tgaaggatac attacttagt gatagattct
                                                                       360
tatgtacttt gctanatnac gtggatatga gttgacaagt ttctctttct tcaatctttt
                                                                       420
aaggggenga ngaaatgagg aagaaaagaa aaggattaeg cataetgtte tttetatngg
                                                                       480
aaggattaga tatgtttcct ttgccaatat taaaaaaata ataatgttta ctactagtga
                                                                       540
aaccc
                                                                       545
      <210> 206
```

<211> 487

```
<212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(487)
      <223> n = A,T,C or G
      <400> 206
ttttttttt tttttagtc aagtttctna tttttattat aattaaagtc ttggtcattt
                                                                         60
catttattag ctctgcaact tacatattta aattaaagaa acgttnttag acaactgtna
                                                                        120
caatttataa atgtaaggtg ccattattga gtanatatat tcctccaaga gtggatgtgt
                                                                       180
cccttctccc accaactaat gaancagcaa cattagttta attttattag tagatnatac
                                                                        240
actgctgcaa acgctaattc tcttctccat ccccatgtng atattgtgta tatgtgtgag
                                                                        300
ttggtnagaa tgcatcanca atctnacaat caacagcaag atgaagctag gcntgggctt
                                                                        360
toggtgaaaa tagactgtgt ctgtctgaat caaatgatct gacctatcct cggtggcaag
                                                                        420
aactettega acceettect caaaggenge tgecacattt gtggentetn ttgcacttgt
                                                                        480
                                                                        487
ttcaaaa
      <210> 207
      <211> 332
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) . . . (332)
      <223> n = A,T,C or G
      <400> 207
tgaattggct aaaagactgc atttttanaa ctagcaactc ttatttcttt cctttaaaaa
                                                                         60
tacatagcat taaatcccaa atcctattta aagacctgac agcttgagaa ggtcactact
                                                                        120
geatttatag gacettetgg tggttetget gttacntttg aantetgaca atcettgana
                                                                        180
atctttgcat gcagaggagg taaaaggtat tggattttca cagaggaana acacagcgca
                                                                        240
gaaatgaagg ggccaggctt actgagcttg tccactggag ggctcatggg tgggacatgg
                                                                        300
                                                                        332
aaaagaaggc agcctaggcc ctggggagcc ca
      <210> 208
       <211> 524
      <212> DNA
       <213> Homo sapien
      <220>
       <221> misc_feature
       <222> (1) ... (524)
       <223> n = A, T, C \text{ or } G
       <400> 208
 agggcgtggt gcggagggcg ttactgtttt gtctcagtaa caataaatac aaaaagactg
                                                                         60
 gttgtgttcc ggccccatcc aaccacgaag ttgatttctc ttgtgtgcag agtgactgat
                                                                        120
 tttaaaggac atggagettg teacaatgte acaatgteac agtgtgaagg geacaeteac
                                                                        180
 tecegegtga tteacattta geaaceaaca atageteatg agtecatact tgtaaatact
                                                                        240
 tttggcagaa tacttnttga aacttgcaga tgataactaa gatccaagat atttcccaaa
                                                                        300
 gtaaatagaa gtgggtcata atattaatta cctgttcaca tcagcttcca tttacaagtc
                                                                        360
 atgageccag acactgacat caaactaage ceaettagae teeteaceae cagtetgtee
                                                                         420
 tgtcatcaga caggaggetg tcaccttgac caaattetca ccagtcaatc atetatecaa
                                                                         480
                                                                         524
 aaaccattac ctgatccact tccggtaatg caccaccttg gtga
```

```
<210> 209
       <211> 159
       <212> DNA
       <213> Homo sapien
       <400> 209
 gggtgaggaa atccagagtt gccatggaga aaattccagt gtcagcattc ttgctccttg
                                                                         60
 tggccctctc ctacactctg gccagagata ccacagtcaa acctggagcc aaaaaggaca
                                                                         120
caaaggactc tcgacccaaa ctgccccaga ccctctcca
                                                                         159
       <210> 210
       <211> 256
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(256)
       <223> n = A,T,C' or G
      <400> 210
actecetgge agacaaagge agaggagaga getetgttag ttetgtgttg ttgaactgee
                                                                          60
actgaatttc tttccacttg gactattaca tgccanttga gggactaatg gaaaaacgta
                                                                         120
tggggagatt ttanccaatt tangtntgta aatggggaga ctggggcagg cgggagagat
                                                                         180
ttgcagggtg naaatgggan ggctggtttg ttanatgaac agggacatag gaggtaggca
                                                                         240
ccaggatgct aaatca
                                                                         256
      <210> 211
      <211> 264
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(264)
      <223> n = A,T,C or G
      <400> 211
acattgtttt tttgagataa agcattgaga gagctctcct taacgtgaca caatggaagg
                                                                         60
actggaacac atacccacat ctttgttctg agggataatt ttctgataaa gtcttgctgt
                                                                        120
atattcaagc acatatgtta tatattattc agttccatgt ttatagccta gttaaggaga
                                                                        180
ggggagatac attcngaaag aggactgaaa gaaatactca agtnggaaaa cagaaaaaga
                                                                        240
aaaaaaggag caaatgagaa gcct
      <210> 212
      <211> 328
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (328)
      \langle 223 \rangle n = A,T,C or G
      <400> 212
acccaaaaat ccaatgetga atatttgget teattattee canattettt gattgtcaaa
                                                                         60
ggatttaatg ttgtctcagc ttgggcactt cagttaggac ctaaggatgc cagccggcag
                                                                        120
gtttatatat gcagcaacaa tattcaagcg cgacaacagg ttattgaact tgcccgccag
                                                                        180
```

```
ttnaatttca ttcccattga cttgggatcc ttatcatcag ccagagagat tgaaaattta
                                                                        240
cccctacnac tctttactct ctgganaggg ccagtggtgg tagctataag cttggccaca
                                                                        300
                                                                        328
ttttttttc ctttattcct ttgtcaga
      <210> 213
      <211> 250
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (250)
      <223> n = A,T,C \text{ or } G
      <400> 213
acttatgage agagegacat atcenagtgt agactgaata aaactgaatt ctctccagtt
taaagcattg ctcactgaag ggatagaagt gactgccagg agggaaagta agccaaggct
                                                                         120
cattatgcca aagganatat acatttcaat totccaaact tottcctcat tocaagagtt
                                                                         180
ttcaatattt gcatgaacct gctgataanc catgttaana aacaaatatc tetetnacct
                                                                         240
                                                                         250
teteateggt
       <210> 214
       <211> 444
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) . . . (444)
       \langle 223 \rangle n = A,T,C or G
       <400> 214
 acccagaatc caatgetgaa tatttggett cattatteec agattetttg attgtcaaag
                                                                          60
 gatttaatgt tgtctcagct tgggcacttc agttaggacc taaggatgcc agccggcagg
                                                                         120
 tttatatatg cagcaacaat attcaagcgc gacaacaggt tattgaactt gcccgccagt
                                                                         180
 tgaatttcat tcccattgac ttgggatcct tatcatcagc canagagatt gaaaatttac
                                                                         240
 ecctacgact ctttactete tggagaggge cagtggtggt agetataage ttggccacat
                                                                         300
 tttttttcc tttattcctt tgtcagagat gcgattcatc catatgctan aaaccaacag
                                                                         360
 agtgactttt acaaaattcc tataganatt gtgaataaaa ccttacctat agttgccatt
                                                                         420
                                                                         444
 actttgetet ecctaatata cete
       <210× 215
       <211> 366
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
        <222> (1) . . . (366)
       <223> n = A,T,C or G
       <400> 215
 acttatgage agagegacat atecaagtgt anactgaata aaactgaatt etetecagtt
                                                                           60
 taaagcattg ctcactgaag ggatagaagt gactgccagg agggaaagta agccaaggct
                                                                          120
 cattatgcca aagganatat acatttcaat tetecaaact tetteeteat tecaagagtt
                                                                          180
 ttcaatattt gcatgaacet gctgataage catgttgaga aacaaatate tetetgacet
                                                                          240
 teteateggt aageagagge tgtaggeaac atggaccata gegaanaaaa aaettagtaa
                                                                          300
 tocaagetgt tttctacact gtaaccaggt ttccaaccaa ggtggaaate tectatactt
                                                                          360
```

```
ggtgcc
                                                                          366
       <210> 216
       <211> 260
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(260)
       \langle 223 \rangle n = A,T,C or G
       <400> 216
ctgtataaac agaactccac tgcangaggg agggccgggc caggagaatc tccgcttgtc
                                                                           60
caagacaggg gcctaaggag ggtctccaca ctgctnntaa gggctnttnc attttttat
                                                                          120
taataaaaag tnnaaaaggc ctcttctcaa ctttttccc ttnggctgga aaatttaaaa
                                                                          180
atcaaaaatt teetnaagtt nteaagetat eatatataet ntateetgaa aaageaacat
                                                                          240
aattetteet teeeteettt
                                                                          260
      <210> 217
       <211> 262
       <212> DNA
      <213> Homo sapien
       <220>
       <221> misc_feature
      <222> (1)...(262)
      \langle 223 \rangle n = A,T,C or G
      <400>.217
acctacgtgg gtaagtttan aaatgttata atttcaggaa naggaacgca tataattgta
                                                                           60
tettgeetat aattttetat tttaataagg aaatagcaaa ttggggtggg gggaatgtag
                                                                         120
ggcattctac agtttgagca aaatgcaatt aaatgtggaa ggacagcact gaaaaatttt
                                                                         180
atgaataatc tgtatgatta tatgtctcta gagtagattt ataattagcc acttacccta
                                                                         240
atateettea tgettgtaaa gt
                                                                         262
      <210> 218
      <211> 205
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(205)
      <223> n = A, T, C or G
      <400> 218
accaaggtgg tgcattaccg gaantggatc aangacacca tcgtggccaa cccctgagca
                                                                          60
cccctatcaa ctcccttttg tagtaaactt ggaaccttgg aaatgaccag gccaagactc
                                                                         120
aggeeteece agttetactg acctttgtee ttangtntna ngtecagggt tgetaggaaa
                                                                         180
anaaatcagc agacacaggt gtaaa
                                                                         205
      <210> 219
      <211> 114
      <212> DNA
      <213> Homo sapien ...
      <400> 219
```

				50
tactgttttg tctcagtaac aataaataca	aaaagactgg	ttgtgttccg	gccccatcca	60
accacgaagt tgatttetet tgtgtgcaga	gtgactgatt	ttaaaggaca	tgga	114
accurate symmetry				
<210> 220				
<211> 93	si, s		0.0	
<211> 33 <212> DNA				
<213> Homo sapien				
<400> 220	aattactttc	toctctttac	atttctttta	60
actagccage acaaaaggca gggtagcctg	aaccgcccc	05000		93
aaataagcat ttagtgctca gtccctactg	ayc			
<210> 221	- ^m			
<211> 167		*		
<212> DNA				
<213> Homo sapien				
<220>			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
<221> misc_feature		*		*
<222> (1)(167)				
$\langle 223 \rangle$ n = A,T,C or G	- X			
The second of th	rabolati elek ili adele ili ele	r Pala sec repries de des	rik van garaparij is kalar baru da.	nappina dumining on s
<400> 221	*			
	gatattccct	tcatcttgga	ttccatgagg	60
tetttgee agetgtge tetactgtag	taagtttctg	ctgatgagga	gccagnatgc	120
ccccactac cttccctgac gctccccana	aatcacccaa	cctctgt		167
Coccactae ettecetgae gotooo				
212. 222			0.0	
<210> 222	No. of the second			
<211> 351	**		2	4.
<212> DNA				
<213> Homo sapien				1
				1.
<400> 222	cattagtagg	aggatgcatt	ctggcacccc	60
agggcgtggt gcggagggcg gtactgacct	gggatactgg	: aggaegtcaa	caacagataa	120
gttetteace tgtececeaa teettaaaag	gccatactgc	toaattttt	cataatccaa	180
atgtttgctg aattaaagga tggatgaaaa	adattaataa	ettadatoco	gggaatettt	240
	CLLLUAGEC	. accurace		300
taggtgagg tgattagaga gcttgtaggt	tgcttttace	Lacaceegge	, acastra	-351
ctcgtatcaa aacaatagat tggtaaaggt	ggtattatts	, tattgataag	, .	332
		8		
<210> 223		0.3		: •
<211> 383				
<212> DNA				
<213> Homo sapien				
	The second second second		Maria de la fermio de la compansión de l	
<220>				• • • • • • • • • • • • • • • • • • • •
<221> misc_feature			•	
<222> (1) (383)	*			
$\langle 223 \rangle$ n = A,T,C or G				
(223) 11 - 31210 02 0				
14005 222				
<400> 223 aaaacaaaca aacaaaaaaa acaattctt	r. atteagaaa	a attatctta	g ggactgatat	60
tggtaattat ggtcaattta atwrtrttk	- accougade	c cttacatto	t cttgacaaga	120
tggtaattat ggtcaattta atwrtrttk	- ggggcacce	a cttcttatc	a aaagtaatgo	180
ttaaaatgtc tgtgccaaaa ttttgtatt	tatttggag	a thatthace	a tatactatto	240
attactact	t freeemrea	C EEULLLYYA	q tgtgttatt	
	r raratttta	a ciliqqiqq	q, ggaaaaragee	
ataggaccac agtetteact tetgatact	t gtaaattaa	t cttttattg	e acceptiting	383
accattaagc tatatgttta aaa			•	202

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```
<210> 224
      <211> 320
      <212> DNA
      <213> Homo sapien
      <400> 224
cccctgaagg cttcttgtta gaaaatagta cagttacaac caataggaac aacaaaaaga
aaaagtttgt gacattgtag tagggagtgt gtacccctta ctccccatca aaaaaaaaat
                                                                      120
ggatacatgg ttaaaggata raagggcaat attttatcat atgttctaaa agagaaggaa
                                                                     180
gagaaaatac tactttctcr aaatggaagc ccttaaaggt gctttgatac tgaaqqacac
                                                                      240
aaatgtggcc gtccatcctc ctttaragtt gcatgacttg gacacggtaa ctgttgcagt
                                                                     300
tttaractcm gcattgtgac
      <210> 225
      <211> 1214
      <212> DNA
      <213> Homo sapien
      <400> 225
gaggactgca gcccgcactc gcagccctgg caggcggcac tggtcatgga aaacgaattg
ttctgctcgg gcgtcctggt gcatccgcag tgggtgctgt cagccgcaca ctgtttccag
                                                                     120
aacteetaea eeateggget gggeetgead agtettgagg eegaccaaga geeagggage
                                                                     180
cagatggtgg aggccagcet ctccgtacgg cacccagagt acaacagace cttgctcgct
                                                                     240
aacgacetea tgeteateaa gttggaegaa teegtgteeg agtetgaeae cateeggage
                                                                    . 300
ateageattg ettegeagtg ceetacegeg gggaactett geetegttte tggetggggt
                                                                     360
ctgctggcga acggcagaat gcctaccgtg ctgcagtgcg tgaacgtgtc ggtggtgtct
                                                                     420
gaggaggtet geagtaaget etatgaceeg etgtaceace ceageatgtt etgegeegge
                                                                     480
ggagggcaag accagaagga ctcctgcaac ggtgactctg gggggcccct gatctgcaac
                                                                     540
gggtacttgc agggccttgt gtctttcgga aaagccccgt gtggccaagt tggcgtgcca
                                                                     600
ggtgtctaca ccaacctctg caaattcact gagtggatag agaaaaccgt ccaggecagt
                                                                     660
taactctggg gactgggaac ccatgaaatt gacccccaaa tacatcctgc ggaaggaatt
                                                                     720
caggaatate tgtteecage cectectee teaggeecag gagtecagge ecceageece
                                                                     780
tectecetea aaccaagggt acagateeee ageeeeteet eeeteagaee caggagteea
                                                                     840
gacceccag ceetectee etcagacca ggagtecage ceetectee teagaccag
                                                                     900
gagtecagae eccecagece etectecete agacecaggg gtecaggece ecaacecete
                                                                     960
eteceteaga eteagaggte caageeecca acceeteett eeccagaeec agaggtecag
                                                                    1020
gtcccagccc ctcctccctc agacccagcg gtccaatgcc acctagactc tccctgtaca
                                                                    1080
cagtgccccc ttgtggcacg ttgacccaac cttaccagtt ggtttttcat tttttgtccc
                                                                    1140
1200
aaaaaaaaa aaaa
                                                                    1214
      <210> 226
      <211> 119
      <212> DNA
      <213> Homo sapien
      <400> 226
acccagtatg tgcagggaga cggaacccca tgtgacagcc cactccacca gggttcccaa
                                                                      60
agaacctggc ccagtcataa tcattcatcc tgacagtggc aataatcacg ataaccagt
      <210> 227
      <211> 818
      <212> DNA
      <213> Homo sapien
     <400> 227
acaatteata gggacgacca atgaggacag ggaatgaace eggeteteee eeageeetga
                                                                      60
```

	ggaaaa acactgggtt ttctgagaac 120
tttttgctac atatggggtc ccttttcatt cttt	grama congectto canagagat 180
	dialaa cogggoodg oxggggaa
	icaddca gagagaeage garaaggara
	ituaat ageagaeeee egaaaaegaa
	CCCac ccaaccccc Louggana
	lauataa tytyucuuot mooniosiisii
analis productions and additional additi	icitaac ceeggeegee coomgegee
	Luadadd Ceaccacoo as June 19
	iccida cacegageeg comogagass
	Jaaccac Ececece Servens
	aducade dadacecua daga
caagaggata tgaggactgt ctcagcctgg ctt	tgggctg acaceaegoa outlines
gtccacttct aggttttcag cctagatggg agt	egtgt 818
geccaeses, mgg	
<210> 228	그는 가는 병과 그리는 동물에 없는 경찰을 보고 말했다.
<211> 744	
<211> /44 <212> DNA	
<213> Homo sapien	
<400> 228	gaccacc ccaggtctcc ttcgtgggat 60
gtcatgacgt ttgacatacc tttggaacga gcc	tectect toggagatog aagacegtgt 120
tegtggeega eetggeetet eetggeetgt tte	tragat goggagtcac atttcaatgg 180
tegtggeega cetggeetet eetggeetge etc	tractor ggaactacca aatggcgaga 240
taggaaaagt ggcttcgtaa aatagaagag cag	agattta tgagcgagt attctctggc 300
tgctcggtgc acattggggt gctttgggat aas	etttere acadeagtee acetetgeag 360
accagattct aggccagttt gttccactga agc	gggagg tcacactgag atcgatgggt 420
getggeaget gaatggettg ceggtggete tgt	statcac attagetect tecaggitag 480
gagaaggeta ggatgettgt ctagtgttet tag	pagagas stoctaging caginacco 540
ccagacggtg ttggccactc ccttctaaaa cac	egettato cattteaagt ttogggttto 600
cegtggtatg cettggeeca ttecageagt cec	tatette attrector ctaageagea 660
ttettttegt taatgtteet etgtgttgte age	ganged taggaaaga cacttettt 720
ttgggagatg tggaccagag atccactcct tag	744
cttcactctg aagtagctgg tggt	
<210> 229	
<211> 300	
<212> DNA	
<213> Homo sapien	
<400> 229	stactitt ctcatccaaa tcatgtgaac 60
cgagtctggg ttttgtctat aaagtttgat cc	acttacce pacaccagae tracatatae 120
DD JDDSSER GESTARA HERERALD	ictionic aacyceagge egacassis
tagaggatta ttattttta attattattattu lii	aqaaacge cacccacage coossis
- LL-L-L-L-C COCCOSCCC FGSGSGGCC CLC	accordena according
cactaggete etecttgeee teacactgga gt	steegeea grgrgggrge ecaetgaear 300
<210> 230	
<211> 301	
<212> DNA	
<213> Homo sapien	9
	*
<400> 230	
caccacaaca aatacaaata toaagagtoc aa	agatetea taaaatetat getgaggaat 60
gagagagat taaaggaga gaagcttgca ga	deaderea adeaageraa adaaceeaaa
	adadcida cccagceady ggagaas
	tdadcate tecaggeeee ceeeasta
gatgaacegg acaagtecea ggggcaggac ct	ccaadaaa cadaccccgg ccgcgcccc
gargaaccgg acaagtccca gagaacaa	301

```
<210> 231
       <211> 301
       <212> DNA
      <213> Homo sapien
       <400> 231
gcaagcacgc tggcaaatct ctgtcaggtc agctccagag aagccattag tcattttagc
                                                                           60
 caggaactcc aagtccacat ccttggcaac tggggacttg cgcaggttag ccttgaggat
                                                                          120
ggcaacacgg gactteteat caggaagtgg gatgtagatg agetgateaa gacggccagg
                                                                          180
 totgaggatg goaggatoaa tgatgtoagg coggttggta cogocaatga tgaacacatt
                                                                          240
tttttttgtg gacatgccat ccatttctgt caggatctgg ttgatgactc ggtcagcagc
                                                                          300
                                                                          301
       <210> 232
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 232
agtaggtatt tcgtgagaag ttcaacacca aaactggaac atagttctcc ttcaagtgtt
                                                                           60
ggcgacagcg gggcttcctg attctggaat ataactttgt gtaaattaac agccacctat
                                                                          120
agaagagtcc atctgctgtg aaggagagac agagaactct gggttccgtc gtcctgtcca
                                                                          180
cgtgctgtac caagtgctgg tgccagcctg ttacctgttc tcactgaaaa tctggctaat
                                                                          240
getettgtgt ateaettetg attetgacaa teaateaate aatggeetag ageaetgaet
                                                                          300
                                                                          301
      <210> 233
       <211> 301
      <212> DNA
       <213> Homo sapien
      <400> 233
atgactgact tcccagtaag gctctctaag gggtaagtag gaggatccac aggatttgag
                                                                           60
atgctaaggc cccagagate gtttgatcca accetettat tttcagaggg gaaaatgggg
                                                                         120
cctagaagtt acagagcate tagctggtgc gctggcaccc ctggcctcac acagactccc
                                                                          180
gagtagetgg gactacagge acacagteae tgaageagge cetgttagea attetatgeg tacaaattaa catgagatga gtagagactt tattgagaaa gcaagagaaa ateetateaa
                                                                          240
                                                                          300
                                                                          301
      <210> 234
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 234
aggtectaca categagaet catecatgat tgatatgaat ttaaaaatta caagcaaaga
                                                                          60
cattttattc atcatgatgc tttcttttgt ttcttctttt cgttttcttc tttttctttt
                                                                         120
tcaatttcag caacatactt ctcaatttct tcaggattta aaatcttgag ggattgatct
                                                                         180
egecteatga cageaagtte aatgtttttg ceaectgact gaaceactte caggagtgee
                                                                         240
ttgatcacca gcttaatggt cagatcatct gcttcaatgg cttcgtcagt atagttcttc
                                                                         300
                                                                         301
      <210>.235
      <211> 283
      <212> DNA
<213> Homo sapien
```

<400> 235	60
tattcaattc tcagcagaag ccagaattcg	60
	120
The state of the s	180
atgttatett tgaactgatg etcataggag agaatataag aactetgagt gatateaaca	240
ttagggattc aaagaaatat tagatttaag ctcacactgg tca	283
ttagggatte adagaaatat tugutuung	
<210> 236	* 0
<211> 301	
<212> DNA	
<213> Homo sapien	19
아마님 사람들은 아이를 하고 있습니다. 그는 그들은 사람들은 사람들은 그는 사람들이 되었다. 사람들은 사람들은 사람들이 되었다면 하는데 되었다면 되었다면 하는데 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면	
<400> 236	60
aggteeteea ceaactgeet gaageaeggt taaaattggg aagaagtata gtgeageata	120
The second of the control of the con	
The state of the s	180
	240
aagcatcgtg taccagtcag aaagcatcaa tactcgacat gaacgaatat aaagaacacc	300
	301
- 환경 - 우리를 살고 함께 있는 그런 하실 하는 스타를 취라면 했다. 어머니는 그 그는 사람들이다.	0 0
	· Car
Survey (210) (210) 237 mentioned by the alternative and alternative to the survey of	erantan radio
[] (<211> 301]	
* <212> DNA	
<213> Homo sapien	
일 하는 그 있는 사람들이 나를 보는 것이 하나 되는 것 같아. 그 가득하는 그리는 것 같아.	
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	<pre></pre>	SC_feate SC_feate SC_feate SC_feate AT,C SC_CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	en lre l) or G tggcttccca tcaatccacc cttgagcaca actggcatta	aagtetaact aaaccateca cagttatgac	agggataccc taatgcaccc caggacagac ggggatgggg	cetetageet agataggeee teatetetat gggeaagtgt	60 120 180 240
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                                                                          120
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                                                                         180
 atgtctcggg cattgaggct gtcaataana cgctgatccc ctgctgtatg gtggtgtcat
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cctagacttc ctaaaccaga teetetgggg ctggaacctg gcactetgca tttgtaatga
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tcgaagagga agtctaatgg aagtaattag tcaacggtcc ttgtttagac tcttggaata
                                                                       180
tgctgggtgg ctcagtgagc ccttttggag aaagcaagta ttattcttaa ggagtaacca
                                                                       240
cttcccattg ttctactttc taccatcatc aattgtatat tatgtattct ttggagaact
                                                                       300
                                                                       301
      <210> 269
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 269
taacaatata cactagetat etttttaact gtecateatt agcaccaatg aagatteaat
                                                                        60
aaaattacct ttattcacac atctcaaaac aattctgcaa attcttagtg aagtttaact
                                                                       120
atagtcacag accttaaata ttcacattgt tttctatgtc tactgaaaat aagttcacta
                                                                       180
cttttctgga tattctttac aaaatcttat taaaattcct ggtattatca cccccaatta
                                                                       240
tacagtagca caaccacett atgtagtttt tacatgatag etetgtagaa gtttcacate
                                                                       300
                                                                       301
```

<210> 270 <211> 301 <212> DNA

```
<213> Homo sapien
      <400> 270
cattgaagag cttttgcgaa acatcagaac acaagtgctt ataaaattaa ttaagcctta
                                                                       60
cacaagaata catatteett ttatttetaa ggagttaaac atagatgtag etgatgtgga
                                                                       120
gagettgetg gtgcagtgca tattggataa cactattcat ggccgaattg atcaagtcaa
                                                                       180
ccaactcctt gaactggatc atcagaagaa gggtggtgca cgatatactg cactagataa
                                                                       240
tggaccaacc aactaaattc tctcaccagg ctgtatcagt aaactggctt aacagaaaac
                                                                      300
                                                                       301
      <210> 271
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (301)
      <223> n = A,T,C or G
      <400> 271
aaaaggttet cataagatta acaatttaaa taaatatttg atagaacatt ettteteatt
tttatagete atetttaggg ttgatattea gtteatgett ecettgetgt tettgateca
gaartgcaat cacttcatca geetgtatte getecaatte tetataaagt gggtecaagg
tgaaccacag agccacagca cacctctttc ccttggtgac tgccttcacc ccatganggt
                                                                       240
tototoctoc agatganaac tgatcatgcg cocacatttt gggttttata gaagcagtca
                                                                       300
                                                                       301
      <210> 272
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 272
taaattgcta agccacagat aacaccaatc aaatggaaca aatcactgtc ttcaaatgtc
                                                                        60
                                                                       120
ttatcagaaa accaaatgag cctggaatct tcataatacc taaacatgcc gtatttagga
tccaataatt ccctcatgat gagcaagaaa aattctttgc gcacccctcc tgcatccaca
                                                                       180
gcatcttctc caacaaatat aaccttgagt ggcttcttgt aatctatgtt ctttgttttc
                                                                       240
ctaaggactt ccattgcatc tcctacaata ttttctctac gcaccactag aattaagcag
                                                                       300
                                                                       301
      <210> 273
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (301)
      <223> n = A,T,C or G
      <400> 273
acatgtgtgt atgtgtatct ttgggaaaan aanaagacat cttgtttayt attttttgg
agagangctg ggacatggat aatcacwtaa tttgctayta tyactttaat ctgactygaa
                                                                       120
```

()据400() (40分)

The same state of the same sta

```
gaaccgtcta aaaataaaat ttaccatgtc dtatattcct tatagtatgc ttatttcacc
                                                                         180
 ttytttctgt ccagagagag tatcagtgac ananatttma gggtgaamac atgmattggt
                                                                         240
 gggacttnty tttacngagm accetgeceg sgegeeeteg makengantt cegesanane
                                                                         300
                                                                         301
       <210> 274
       <211> 301
       <212> DNA-
       <213> Homo sapien
       <220>
       <221> misc feature
      <222> (1)...(301)
       <223> n = A, T, C or G
       <400> 274
cttatatact ctttctcaga ggcaaaagag gagatgggta atgtagacaa ttctttgagg
                                                                          60
aacagtaaat gattattaga gagaangaat ggaccaagga gacagaaatt aacttgtaaa
                                                                         120
tgattctctt tggaatctga atgagatcaa gaggccagct ttagcttgtg gaaaagtcca
                                                                         180
tctaggtatg gttgcattct cgtcttcttt tctgcagtag ataatgaggt aaccgaaggc
                                                                         240
aattgtgctt cttttgataa gaagctttct tggtcatatc aggaaattcc aganaaagtc
                                                                         300
                                                                         301
      <210> 275
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      \langle 223 \rangle n = A,T,C or G
      <400> 275
teggtgteag cageacgtgg cattgaacat tgcaatgtgg ageecaaace acagaaaatg
gggtgaaatt ggccaacttt ctattaactt atgttggcaa ttttgccacc aacagtaagc
                                                                        120
tggcccttct aataaaagaa aattgaaagg tttctcacta aacggaatta agtagtggag
                                                                        180
tcaagagact cccaggcctc agcgtacctg cccgggcggc cgctcgaagc cgaattctgc
                                                                        240
agatatecat cacactggeg gnegetegan catgeateta gaaggnecaa ttegecetat
                                                                        300
                                                                        301
      <210> 276
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 276
tgtacacata ctcaataaat aaatgactgc attgtggtat tattactata ctgattatat
                                                                         60
ttatcatgtg acttctaatt agaaaatgta tccaaaagca aaacagcaga tatacaaaat
                                                                        120
taaagagaca gaagatagac attaacagat aaggcaactt atacattgag aatccaaatc
                                                                        180
caatacattt aaacatttgg gaaatgaggg ggacaaatgg aagccagatc aaatttgtgt
                                                                        240
aaaactattc agtatgtttc cettgettca tgtetgagaa ggeteteett caatggggat
                                                                        300
                                                                        301
      <210> 277
      <211> 301
      <212> DNA
      <213> Homo sapien
```

```
<220>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A, T, C \text{ or } G
      <400> 277
tttgttgatg tcagtatttt attacttgcg ttatgagtgc tcacctggga aattctaaag
                                                                         60
atacagagga cttggaggaa gcagagcaac tgaatttaat ttaaaagaag gaaaacattg
                                                                        120
gaatcatgge actectgata ettteccaaa teaacactet caatgeecca ceetegteet
                                                                        180
caccatagtg gggagactaa agtggccacg gatttgcctt angtgtgcag tgcgttctga
                                                                        240
gttenetgte gattacatet gaccagtete ettttteega agteenteeg tteaatettg
                                                                        300
                                                                        301
      <210> 278
      <211> 301
      <212> DNA
      <213> Homo sapien
      <221> misc_feature
      <2225 (1) ... (301)
      <223> n = A,T,C or G
      <400> 278
taccactaca ctccagcetg ggcaacagag caagacetgt ctcaaagcat aaaatggaat
                                                                        . 60
aacatatcaa atgaaacagg gaaaatgaag ctgacaattt atggaagcca gggcttgtca
                                                                        1.20
cagtetetae tgttattatg cattacetgg gaatttatat aageeettaa taataatgee
                                                                        180
aatgaacate teatgtgtge teacaatgtt etggeactat tataagtget teacaggttt
                                                                        240
tatgtgttct tcgtaacttt atggantagg tactcggccg cgaacacgct aagccgaatt
                                                                        300
                                                                        301
      <210> .279
       <211> 301
      <212> DNA
      <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (301)
       <223> n = A, T, C or G
       <400> 279
 aaagcaggaa tgacaaagct tgcttttctg gtatgttcta ggtgtattgt gacttttact
                                                                         60
 gttatattaa ttgccaatat aagtaaatat agattatata tgtatagtgt ttcacaaagc
                                                                        120
 ttagacettt acettecage caceceacag tgettgatat tteagagtea greattggtt
                                                                         180
 atacatgtgt agttccaaag cacataagct agaanaanaa atatttctag ggagcactac
                                                                         240
 catetgitti cacatgaaat gecacacaca tagaacteca acateaatti catigeacag
                                                                         300
                                                                         301
       <210> 280
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 280
                                                                          60
 ggtactggag ttttcctccc ctgtgaaaac gtaactactg ttgggagtga attgaggatg
 tagaaaggtg gtggaaccaa attgtggtca atggaaatag gagaatatgg ttctcactct
                                                                         120
```

```
tgagaaaaaa acctaagatt agcccaggta gttgcctgta acttcagttt ttctgcctgg
                                                                        180
 gtttgatata gtttagggtt ggggttagat taagatctaa attacatcag gacaaagaga
                                                                        240
 cagactatta actocacagt taattaagga ggtatgttoc atgtttattt gttaaagcag
                                                                        300
                                                                        301
       <210> 281
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 281
 aggtacaaga aggggaatgg gaaagagctg ctgctgtggc attgttcaac ttggatattc
 gccgagcaat ccaaatcctg aatgaagggg catcttctga aaaaggagat ctgaatctca
                                                                        120
 atgtggtagc aatggcttta tcgggttata cggatgagaa gaactccctt tggagagaaa
                                                                        180
 tgtgtagcac actgcgatta cagctaaata acccgtattt gtgtgtcatg tttgcatttc
                                                                        240
 tgacaagtga aacaggatct tacgatggag ttttgtatga aaacaaagtt gcagtacctc
                                                                        300
                                                                        301
       <210> 282
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 282
caggtactac agaattaaaa tactgacaag caagtagttt cttggcgtgc acgaattgca
                                                                        60
tccagaaccc aaaaattaag aaattcaaaa agacattttg tgggcacctg ctagcacaga
                                                                       120
agegeagaag caaageecag geagaaceat getaacetta cageteagee tgeacagaag
                                                                       180
cgcagaagca aagcccaggc agaaccatgc taaccttaca gctcagcctg cacagaagcg
                                                                       240
cagaagcaaa gcccaggcag aacatgctaa ccttacagct cagcctgcac agaagcacag
                                                                       300
      <210> 283
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 283
atctgtatac ggcagacaaa ctttatarag tgtagagagg tgagcgaaag gatgcaaaag
cactttgagg gctttataat aatatgctgc ttgaaaaaaa aaatgtgtag ttgatactca
                                                                      120
gtgcatctcc agacatagta aggggttgct ctgaccaatc aggtgatcat tttttctatc
                                                                       180
acttcccagg ttttatgcaa aaattttgtt aaattctata atggtgatat gcatctttta
                                                                       240
ggaaacatat acatttttaa aaatctattt tatgtaagaa ctgacagacg aatttgcttt
                                                                       300
      <210> 284
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 284
caggtacaaa acgctattaa gtggcttaga atttgaacat ttgtggtctt tatttacttt
gcttcgtgtg tgggcaaagc aacatcttcc ctaaatatat attaccaaga aaagcaagaa
                                                                      120
gcagattagg tttttgacaa aacaaacagg ccaaaagggg gctgacctgg agcagagcat
                                                                      180
ggtgagaggc aaggcatgag agggcaagtt tgttgtggac agatctgtgc ctacttatt
actggagtaa aagaaaacaa agttcattga tgtcgaagga tatatacagt gttagaaatt
                                                                      300
                                                                   301
```

```
<211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (301)
      <223> n = A, T, C \text{ or } G
      <400> 285
acatcaccat gatcggatcc cccacccatt atacgttgta tgtttacata aatactcttc
aatgatcatt agtgttttaa aaaaaatact gaaaactcct tctgcatccc aatctctaac
                                                                       · 120
caggaaagca aatgctattt acagacctgc aagccctccc tcaaacnaaa ctatttctgg
                                                                        180
attaaatatg tetgaettet tttgaggtea caegaetagg caaatgetat ttaegatetg
                                                                        240
caaaagctgt ttgaagagtc aaagccccca tgtgaacacg atttctggac cctgtaacag
                                                                        300
                                                                        301
      <210> 286
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 286
taccactgca ttccagcctg ggtgacagag tgagactccg tctccaaaaa aaactttgct
                                                                         60
tgtatattat ttttgcctta cagtggatca ttctagtagg aaaggacagt aagattttt
                                                                        120
atcaaaatgt gtcatgccag taagagatgt tatattettt teteatttet tececaceca
                                                                        180
aaaataaget accatatage ttataagtet caaatttttg cettttacta aaatgtgatt
                                                                        240
gtttctgttc attgtgtatg cttcatcacc tatattaggc aaattccatt ttttcccttg
                                                                        300
                                                                        301
       <210> 287
       <211> 301
       <212> DNA
       <213> Homo sapien
      <400> 287
tacagatctg ggaactaaat attaaaaatg agtgtggctg gatatatgga gaatgttggg
                                                                         60
cccagaagga acgtagagat cagatattac aacagctttg ttttgagggt tagaaatatg
                                                                        120
aaatgatttg gttatgaacg cacagtttag gcagcagggc cagaatcetg accetetgec
                                                                        180
cegtggttat ctcctcccca gcttggctgc ctcatgttat cacagtattc cattttgttt
                                                                        240
gttgcatgtc ttgtgaagcc atcaagattt tetegtctgt tttcctctca ttggtaatgc
                                                                        300
                                                                        301
       <210> 288
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 288
 gtacacctaa ctgcaaggac agctgaggaa tgtaatgggc agccgctttt aaagaagtag
                                                                         60
 agtcaatagg aagacaaatt ccagttccag ctcagtctgg gtatctgcaa agctgcaaaa
                                                                         120
 gatetttaaa gacaatttca agagaatatt teettaaagt tggcaatttg gagateatae
                                                                         180
 aaaagcatct gettttgtga tttaatttag eteatetgge caetggaaga atecaaacag
                                                                         240
 tetgeettaa tittggatga atgeatgatg gaaatteaat aatttagaaa gitaaaaaaa
                                                                         300
                                                                         301
```

<210> 289

<211> 301

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```
<212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(301)
       <223> n = A,T,C or G
       <400> 289
ggtacactgt ttccatgtta tgtttctaca cattgctacc tcagtgctcc tggaaactta
gettttgatg tetecaagta gtecacette atttaactet ttgaaactgt atcatetttg
                                                                         120
ccaagtaaga gtggtggcct atttcagctg ctttgacaaa atgactggct cctgacttaa
                                                                         180
cgttctataa atgaatgtgc tgaagcaaag tgcccatggt ggcggcgaan aagagaaaga
                                                                         240
tgtgttttgt tttggactet ctgtggteec ttecaatget gtgggtttee aaccagngga
                                                                         300
                                                                         301
      <210> 290
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(301)
      \langle 223 \rangle n = A,T,C.or.G
      <400> 290
acactgaget ettettgata aatatacaga atgettggea tatacaagat tetatactae
                                                                          60
tgactgatct gttcatttct ctcacagctc ttacccccaa aagcttttcc accctaagtg
                                                                         120
ttetgacete ettttetaat cacagtaggg atagaggcag anecacetae aatgaacatg
                                                                        180
gagttctatc aagaggcaga aacagcacag aatcccagtt ttaccattcg ctagcagtgc
                                                                         240
tgccttgaac aaaaacattt ctccatgtct cattttcttc atgcctcaag taacagtgag
                                                                         300
                                                                         301
      <210> 291
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 291
caggtaccaa tttcttctat cctagaaaca tttcatttta tgttgttgaa acataacaac
                                                                         60
tatatcaget agatttttt tetatgettt acetgetatg gaaaatttga cacattetge
                                                                         120
tttactcttt tgtttatagg tgaatcacaa aatgtatttt tatgtattct gtagttcaat
                                                                         180
agecatgget gtttacttca tttaatttat ttagcataaa gacattatga aaaggeetaa
                                                                        240
acatgagett caetteecca etaactaatt ageatetgtt atttettaac egtaatgeet
                                                                        300
                                                                        301
      <210> 292
      <211> 301
      <212> DNA
      <213> Homo sapien
     <220>
     <221> misc_feature
     <222> (1)...(301)
     \langle 223 \rangle n = A,T,C or G
     <400> 292
```

```
accttttagt agtaatgtct aataataaat aagaaatcaa ttttataagg tccatatagc
                                                                        60
tgtattaaat aatttttaag tttaaaagat aaaataccat cattttaaat gttggtattc
                                                                       120
aaaaccaaag natataaccg aaaggaaaaa cagatgagac ataaaatgat ttgcnagatg
                                                                       180
ggaaatatag tasttyatga atgttnatta aattccagtt ataatagtgg ctacacactc
                                                                        240
tcactacaca cacagacccc acagtectat atgccacaaa cacattteca taacttgaaa
                                                                        300
                                                                        301
      <210> 293
      <211> 3.01
      <212> DNA
      <213> Homo sapien
      <400> 293
ggtaccaagt gctggtgcca gcctgttacc tgttctcact gaaaagtctg gctaatgctc
ttgtgtagte acttetgatt etgacaatea ateaateaat ggeetagage actgactgtt
                                                                        120
aacacaaacg tcactagcaa agtagcaaca gctttaagtc taaatacaaa gctgttctgt
                                                                        180
gtgagaattt tttaaaaggc tacttgtata ataacccttg tcatttttaa tgtacctcgg
                                                                        240
ccgcgaccac gctaagccga attctgcaga tatccatcac actggcggcc gctcgagcat
                                                                        300
       <210> 294
      <211> 301
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(301)
       \langle 223 \rangle n = A,T,C or G
       <400> 294
 tgacccataa caatatacac tagctatctt tttaactgtc catcattagc accaatgaag
                                                                         60
 atteataaa attacettta tteacacate teaaaacaat tetgeaaatt ettagtgaag
                                                                        120
 tttaactata gtcacaganc ttaaatattc acattgtttt ctatgtctac tgaaaataag
                                                                         180
 ttcactactt ttctgggata ttctttacaa aatcttatta aaattcctgg tattatcacc
                                                                         240
 cccaattata cagtagcaca accaccttat gtagttttta catgatagct ctgtagaggt
                                                                         300
                                                                         301
       <210> 295
       <211> 305
        <212> DNA
        <213> Homo sapien
       <400> 295
 gractettte teteceetee tetgaattta attettteaa ettgeaattt geaaggatta
 cacatttcac tgtgatgtat attgtgttgc aaaaaaaaa gtgtctttgt ttaaaattac
                                                                         120
 ttggtttgtg aatccatctt gctttttccc cattggaact agtcattaac ccatctctga
                                                                         180
 actggtagaa aaacrtctga agagctagtc tatcagcatc tgacaggtga attggatggt
                                                                         240
 teteagaace attteaceea gacageetgt ttetateetg tttaataaat tagtttgggt
                                                                         300
                                                                         305
 tctct
        <210> 296
        <211> 301
        <212> DNA
        <213> Homo sapien
        <400> 296
  aggtactatg ggaagctgct aaaataatat ttgatagtaa aagtatgtaa tgtgctatct
                                                                          60.
```

```
cacctagtag taaactaaaa ataaactgaa actttatgga atctgaagtt attttccttg
                                                                         120
 attaaataga attaataaac caatatgagg aaacatgaaa ccatgcaatc tactatcaac
                                                                         180
 tttgaaaaag tgattgaacg aaccacttag ctttcagatg atgaacactg ataagtcatt
                                                                         240
 tgtcattact ataaatttta aaatctgtta ataagatggc ctatagggag gaaaaagggg
                                                                         300
                                                                         301
       <210> 297
       <211> 300
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (300)
       <223> n = A, T, C or G
       <400> 297
 actgagtttt aactggacgc caagcaggca aggctggaag gttttgctct ctttgtgcta
 aaggttttga aaaccttgaa ggagaatcat tttgacaaga agtacttaag agtctagaga
                                                                        120
 acaaagangt gaaccagctg aaagctctcg ggggaanctt acatgtgttg ttaggcctgt
 tecateattg ggagtgeact ggecatecet caaaatttgt etgggetgge etgagtggte
 accycacete gyccycyaec acyctaayee gaattetyca gatatecate acaetyyeyy
       <210> 298
       <211> 301
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (301)
      <223> n = A, T, C or G
      <400> 298
tatggggttt gtcacccaaa agctgatgct gagaaaggcc tccctggggc ccctcccgcg
                                                                         60
ggcatctgag agacctggtg ttccagtgtt tctggaaatg ggtcccagtg ccgccggctg
                                                                        120
tgaagetete agateaatea egggaaggge etggeggtgg tggeeacetg gaaceaceet
                                                                        180
gteetgtetg tttacattte actayeaggt tttetetggg cattaenatt tgtteeceta
                                                                        240
caacagtgac ctgtgcattc tgctgtggcc tgctgtgtct gcaggtggct ctcagcgagg
                                                                        300
      <210> 299
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 299
gttttgagac ggagtttcac tcttgttgcc cagactggac tgcaatggca gggtctctgc
                                                                        60
teactgeace etetgeetee caggitegag caatteteet geeteageet eccaggiage
                                                                       120
tgggattgca ggctcacgcc accataccca gctaattttt ttgtattttt agtagagacg
                                                                       180
gagtttegee atgttggeea getggtetea aacteetgae etcaagegae etgeetgeet
                                                                       240
cggcctccca aagtgctgga attataggca tgagtcaaca cgcccagcct aaagatattt
                                                                       300
                                                                       301
      <210> 300
      <211> 301
   - <212> DNA
      <213> Homo sapien
```

<400> 300	60
atteagtttt atttgetgee ecagtatetg taaccaggag tgecacaaaa tettgecaga	120
	180
	240
The second of the second state of the second	300
tataaageet geetetaaca gteettgett etteacacca atceegageg cateececat	301
	301
<210> 301	
<211> 301	
<212> DNA	
<213> Homo sapien	
	* * : =
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The same and a same a sa	240
The second of th	300
cacaacagca cctcgttcag ctgccacatg tgtgaataag gatgcaatgt ccagaagtgt	300
	301
r various landeres en extremente administrativa representativa esta versa versa esta esta esta esta esta esta e	of real strategies, they have
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LI LL _ L L AFFAAFAFF AFFFAFAAFAFA AALAGUUUUU UUUUUUUUUUUU	
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tggctaatgg aactaccgct tgcatgttaa aaatggtggt ttgtgaaatg atcataggcc	180
The second of th	. 200
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	301
- C	
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gauculoagu caulogygua aggasana a aggasana a aggasana a aggasana aggasana aggasana aggasana aggasana aggasana a	

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graceanttt gagtggcaac	aatqcagcag	Cagaaccaac	ggaaacaaca	gaacgaccgc	647
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	, www.aardddi	Laalligity	- cacyy cacy		240
	· ~~Taaaatcc	CLLauctique	, ququucyav		300
LLL torrestrat	· daaddaddu	. LLAYAYYAYA	, cacagacae-		360
agasttagt	. Factoancea	uuaatawtyo			420
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. •		3			*
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						180
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. 9	geteteggta gtecagecae	tgtgaaacat	atttaatta	tatetatasa	ttctattact	-300
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				*		
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     <210> 338
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     <400> 338
Leu Leu Ala Asn Asp Leu Met Leu Ile
```

<210> 339 <211> 318 <212> PRT <213> Homo sapien

Υ(
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) m	
	그는 요즘 그렇게 들어가는 하는 것이 되면 이 그리다는 것이 없는데 없다.
🛥 - sur sub-purpe resident erge y resser (sur remeter esser) - 1 (1) (1) (1)	Commission of the metal formation of the commission of the commiss
	그렇게 하는 그는 중에 되고 있는 사람들이 되는 사람들이 가장 함께 되었다. 그런 그렇게 되었다. 그런 그런 그 그 그 그리고 없는 그를 살아 되었다. 그런
	나는 그는 속에 다른 경기를 가는 것으로 살아가 되었다. 나는 것은 것은 것이 없는데 된다.
▶	

```
25
Cys Thr Ser Thr Val Gln Leu pro Gly Lys Val Val Val Thr Gly
Ala Asn Thr Gly Ile Gly Lys Glo, The Ala Lys Glu Leu Ala Gln Arg
Gly Ala Arg Val Tyr Leu Ala Cys Arg Asp Va l Glu Lys Gly Glu Leu
                                        75
Val Ala Lys Glu Ile Gln Thr Thr Thr Gly Asn Gln Gln Val Leu Val
                85
                                    90
Arg Lys Leu Asp Leu Ser Asp Thr Lys Ser Ile Arg Ala Phe Ala Lys
                                105
Gly Phe Leu Ala Glu Glu Lys His Leu His Val L eu Ile Asn Asn Ala
                            120
Gly Val Met Met Cys Pro Tyr Ser Lys Thr Ala Ası > Gly Phe Glu Met
                        135
                                           140
His Ile Gly Val Asn His Leu Gly His Phe Leu Leu 1 Thr His Leu Leu
                                       155
                    150
Leu Glu Lys Leu Lys Glu Ser Ala Pro Ser Arg Ile Val Asi n Val Ser
                                   170
Ser Leu Ala His His Leu Gly Arg Ile His Phe His Asn Leu ( In Gly
                                                   190
Glu Lys Phe Tyr Asn Ala Gly Leu Ala Tyr Cys His Ser Lys Leu Ala
                           200
Asn Ile Leu Phe Thr Gln Glu Leu Ala Arg Arg Leu Lys Gly Ser Gly
                       215
Val Thr Thr Tyr Ser Val His Pro Gly Thr Val Gln Ser Glu Leu Val
                                       235
Arg His Ser Ser Phe Met Arg Trp Met Trp Trp Leu Phe Ser Phe Phe
               245
                                  250
Ile Lys Thr Pro Gln Gln Gly Ala Gln Thr Ser Leu His Cys Ala Leu
                               265
Thr Glu Gly Leu Glu Ile Leu Ser Gly Asn His Phe Ser Asp Cys His
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                           280
Val Ala Trp Val Ser Ala Gln Ala Arg Asn Glu Thr Ile Ala Arg Arg
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Leu Trp Asp Val Ser Cys Asp Leu Leu Gly Leu Pro Ile Asp
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<210> 341 <211> 344 <212> DNA <213> Homo sapien

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and the second to the second of the second to the second to the second of the second 	e de la company algune a la company de l
그는 그리고 하는 그리고 있는 그는 사이를 생각하고 있다. 는	
Mary Commence of the Commence	ARTHUR SERVICE SERVICE STORY

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<400>..341
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                                                                          60
 ctgctgctga gtcacagatt tcattataga aauggstgag agtttctaaa ccaactctct
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 tatttttact aaccattcta tttttauctt ctttccataa agagtagete aaaatatgca
                                                                         180
gctgccttac aagtattaaa tatttytttt atctgcagta atatgtatat catctattag
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caatgtggaa acttctaatgc caagagagtg atggaaacca ttggcaagac tttgttgatg
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tecetcagaa garggaaagag tteetgtgtg tgetgaagtt etgaagggea gteaaattea
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aagtgcca,ggg ctgtttggtg caaatgcaaa agcacaggtc tttttagcat gctggtctct
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tragraturer tatgraaata atrostrettet tetaaattte teetaggett catttteraa
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cccgtottett ggtttgtgat gtcttttctg ctttccatta attctataaa atagtatggc
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                                                                        592
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                                                                        240
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                                                                        420
caactaacct gccactaata gttatgtcat ccctcttatt aatcatcatc ctagccctaa
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gtctggccta tgagtgacta caaaaaggat tagactgagc cgaataacaa aaaaaa
                                                                        536
      <210> 345
```

<211> 251

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	* 1
	**
어디는 하다. 그 이 사는 이는 이를 모습니다. 그렇게 그리고 되는 목가를 만난 그 사람이 많아 모습니다. 회가 없다.	
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making in a parameter and the second of the	o waterways a terminamen
	× .
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```
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   gcgtgggcca ggaaatcaca tcctacactg cccaggagcc agacacattt atggaacaga
                                                                           120
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   gtgccatttc c
                                                                           240
                                                                           251
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  agggagacta tacctggctc ttgccctaag tgagaggtct tccctcccgc accaaaaaat
                                                                          120
  agaaaggett tetattteae tggeecaggt agggggaagg agagtaaett tgagtetgtg
                                                                          180
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                                                                          240
                                                                          282
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                                                                          60
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 tataaagaat tttttttgt c
                                                                         180
                                                                         201
       <210> 348
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gccctgcctc c
                                                                        240
                                                                        251
      <210> 349
      <211> 251
      <212> DNA
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🗪 and the contraction of the co	
	74
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```
<213> Homo sapien
```

<400 249	
<400> 349	
taaaaatcaa gccatttaat tgtatctttg aaggtaaaca atatatggga gct	ggatcac 60
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cagaagggtc tgaactctac gtgttaccag agaacataat gcaattcatg cat	tccactt 180
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cggctggaat tgctctggtt atgatgacag agaaaatgat ctcttcctct gtga	gcccac 120
Cacctataaa tttaatagaa aatattaaa aattaaaaaa aatataaaaa	icaccaa 180
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aaaaaaggac tacagtgttc tatacgttgt tcccggtcct gtacgatttc agta	tgtctt 900
aatcgcag	, . 908
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cattaacttg attttaaaat cagwittgyg agtcatttac cacaagctaa atgt	aattca 120
tatgataaaa acaaccatta tattgatatt titataaana atagtaatta atga	gtacac 180
tatgataaaa acaaccattg tattcctgtt tttctaaaca gtcctaattt ctaa	cactgt 240
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gatetgteca caacaaactt geeeteteat geettgeete teaceatget etge	tccagg 360
teageceet titggeetgt tigttitgte aaaaacetaa tetgettett gett	ttcttg 420
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caggetgegt teegteetta egatgaagae caegatgeag tttecaaaca ttge	igugug 120
atacatogaa aggaggggaa aggaaggaa gaaataaaa taatatata taata	cactac 180
atacatggaa aggagggga agccaaccca gaaatgggct ttctctaatc ctggcaataagcaca a	
and any of the Control of the Contro	251

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AND THE POWERS OF THE PARTY OF THE PROPERTY OF THE PARTY	
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                                                                        180
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                                                                       180
ctggcagtag aagctgttct ccaggtacat ttctctagct catgtacaaa aacatcctga
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gagtacatgc agtaatgggg tagatgtgtg tggtgtgtct tcattcctgc aagggtgctt
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attagatttt cttgacttgt atgtatctgt gagatcttga ataagtgacc tgacatctct
                                                                       660
gcttaaagaa aaccag
                                                                       676
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	Ť.,,		

	e *C,	and the second s	

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                                                                              120
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                                                                              180
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                                                                              240
       agatacaage tegittacat gigatagate taacaaagge atetacegaa gietggietg
                                                                              300
      gatagacggc acagggagct cttaggtcag cgctgctggt tggaggacat tcctgagtcc
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    atagatataa ttattccagt ttttttaaaa cttaaaarat attccattgc cgaattaara
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    araarataag tgttatatgg aaagaagggc attcaagcac actaaaraaa cctgaggkaa
                                                                           120
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                                                                           360
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                                                                         180
  attaaagatg tgaagattaa gatcttggtg gcattcaggg attggcactt ctacaagaaa
                                                                         240
  tcactgaagg gagtaatgtg acattacttt tcacttcagg atggccattc taactccagg
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  gggtagactg gactaggtaa gactggaggc aggtagacct cttctaaggc ctgcgatagt
                                                                         360
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ctcaccagaa gaataaagtg ctctgccagt tattaaagga ttactgctgg tgaattaaat
atggcattcc ccaagggaaa tagagagatt cttctggatt atgttcaata tttatttcac
                                                                      120
                                                                      180
                                                                      240
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(118)	
The control of the second of t	ass salvegal filosofic or and the state of the fact of the salvegal of the sal

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and the state of t	
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Marie Company of the	a the state of the second of t
ar and a second	

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```

ggccatgctt gttttttgat tcgatatcag caccgtataa gagcagtgct ttggccatta

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	alallacaca	acququeee	3	1860
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Met Asp Ile Val Val Ser Gly Ser I	10	IP var in	15	
1 Leu His Leu Ala Gly Ser Asp Leu 1		Ser Leu Me		
	25	30)	•
Glu Tyr Thr Ile Val His Ala Ser	Phe Ile Ser			,
35 40		40	•	and the second second
Leu Asp Gly Gln Gly Glu Arg Gln	Glu Gln Arg	Gly His Pl	ne Trp Arg	,
50 55		60		

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Pro Gln Arg Leu Leu Cys Glu Asp Ala Trp Glu Gln Glu Val Gln Val
 Val Leu Pro Leu Pro Leu Leu Gln Gly Ser Gly Lys Ser Asn Val
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 Val Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr
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His Val His Gly Glu Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp
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 Gly Lys Val Pro Arg Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp
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Val Asn Lys Arg Asp Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser
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Gln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr Ala Leu Thr Lys Ala
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                                   .
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Ala Val Tyr Asn Glu Asp Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr
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Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly Leu Thr Pro Leu Leu
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Leu Gly Ile His Glu Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys
           260
                              265
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                          280
                                             285
Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu
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Ser Met Leu Phe Leu Val Ile Ile Met
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Gln Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu
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Val Val Lys Leu Xaa Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp
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.90

Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro
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Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Xaa Tyr Asn Glu Asp
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Lys Asn Lys Val

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Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser His His Val

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			34	0			*	. 34!	5				35	Λ.	
Ile	e Čys	s Gl			i Sei	c Ası	o Tvi			ı Lv:	s Gli	n Mei			s Ile
	7	35					360					36!		u Dy	3 116
Se	r Sei	r Gl	u Ası	a Sei	: Ası	ı Pro			val	l Sei	r Arc			7 700	n Lys
	370	0				375					380		L. ALL	y AS	и гуа
Pro		7 -	r Hi	s Met	Val). 1. Val	her.				. זר		a Ser
385		,			390				· Ant	39!		- F1() WI	a Ale	
		Lite	s I.ve	e Dro			r Lai	1 Arc				. 01.		. m	400 Cys
		- - -	- -	405		. 0.1	, ner	ı ALÇ	410		s Met	- GT)	, га		-
Cvs	: Arc	T CV	e Dhe			Care	. A	. (1)						41!	o l Gly
- /-		, -,	420		, cys	, cya	. WIG	425		. 61)	L L'A	s ser			r GIA
Thi	Ser	- G1v			n ar						mb.		430	,	Lys
		43!		, 1113	, veř	, war	440		Met	. Lys	3 Ini		_	y sei	c ràs
Met	GI.		-	Cve	720	. uic			Dwa			445			
	450		, 17,	Cys	MIG	455		Pne	Pro	Cys		_	GT	, sei	Gly
Lvc			1751	Cl.					1772 -		460				_
465	, ber	. ASI	ı val	. Gry	470		СТУ	Asp	HIS			Ser	. ATa	ı Met	Lys
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1111	. Det	, MI	, ASI	. БуЗ 485	Mec	. Сту	гуѕ	Trp			HIS	Cys	Phe		Суз
Cve	Aro	. ci.						77-3	490				_	495	
. Cys	. ALY	GT	500	GLY						ALa	Trp	Gly			Asp
) an		- n1-	500					505			_		510		1 .
nop	, ser	515		: Met	GIU	Pro			HIS	vaı	Arg			Asp	Leu
λου	Lare			- n'	77-	77-	520		~1	· •		525			o .
nop.	, дуз 530	pet	LUIS	Arg	Ата			Trp	GIA	гуѕ			Arg	Lys	Asp
Tair		4.0	Mot	-T 011	· .	535			**- 7		540		_	_	
545		. val	Mec	Leu	550		inr	Asp	vai			гåа	Asp	Lys	Gln
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2,5	n.y	1111	ALG	Leu .565	uis	Leu	ALA	ser			GIY	Asn	ser		
Val	Lva	T.e.i	T.Au		'A'cn	7 ~~	N	<u>٠</u>	570		3		. 7	575	_
,	275	LCU	580	Leu	ASP	Arg	ALG	585	GIII	rea	ASI	vaı			Asn
Lvs	Tive	Δτα		Ala	Lou	Tle	Tura		1757	C1-	~	~1	590		
. –,	2,0	595		AI a	Deu	116	600	Ala	vai	GIII	Cys		GIU	Asp	Glu
Cvs	Ala			Leu	Len	GT ₁₁		Clar	The	2	Ď	605			
-75	610	200		Dea	Deu	615		GTA	THE	Asp		ASI	тте	Pro	Asp
Glu			Agn	Thr	Thr			There	21-	TIA	620	B ===	-01	•	• :
625	-1-				630	nea	1113	TYL	MIG	635		ASII	GIU	Asp	
,		Ala	Lvs	Ala		T.O.	LAN	Ture	G) v			T1.	~ 1		640
	٠,٠٠٠		-,,,	645	DCu	пец	пеи	1 y L	650	Ala	Asp	11e	GIU		гЛа
Asn	Lvs	His	Glv	Leu	Thr	Dro	T.ou	T.OU		<i>G</i> 1	17-1	174 -	<u>مَ</u> ٢٠٠٠	655	•
	-7-	,	660	Deu	1111	110	Deu	665	neu	GIY	val	HIS		GIN	rys
Gln	Gln	Vál		Lys	Dhe	Len	Tla		Tuo	Tura	77.	7	670	3	
		675		2,5	1116	Deu		Буз				685		ASN	Ala
Leu	Asp		Tvr	Gly	Ara	Thr								·	G1
	690	3	-7-	CLY	AL 9	695	лта	Leu	116	Deu		vai	сув	cys	GIA
Ser		Ser	Tle	Val:	Ser		Lau	Lou	C1.,	C1-	700	T1.	3	**- 7	
705				• • • • • • • • • • • • • • • • • • • •	710		Deu	Deu	GIU	715	ASII	Tie	Asp	vaı	
		Asp	Len	Sér			Thr	. וג	N		M		*** *	.	720
	-		Deu	725	GIY	GIII	1111	HIG		GIU	Tyr	ATA	vai		ser
His	Hig	Hie.	Va 1		Circ	di		T	730	3	·			735	
	****	1113	740	Ile	Cys	GIII	Leu		ser	Asp	ıyr	гåг		Lys	GIn
Met	T:em	Tare		Ca=	· Com	~ 1	3	745	.		~~	;	750	_	
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ALG.	GIU	val	GIU	Glu	GIU	Met	гЛЗ	гàз	His	Glu	Ser	Asn	Asn	Val	Gly

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	T 033	Tou	Glu	λen	T.eu	Thr	Asn	Glv	Val	Thr	Ala	Gly	Asn	Gly	Asp	Asn
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	-	T	T1'-	D-0	C12	744	Lve	Ser	Ara	Thr	Pro	Glu	Asn	Gln	Gln	Phe
	GIÀ	Leu	11e	PIO	GIII.	ALG	цуз	840	••••				845			
	8		835			01.	c1.,	Tur	Hic	Arg-	Tle	Cvs	Glu	Leu	Val	Ser
	Pro		Asn	GIU	ser	GIU	GIU	TÄT	IIIS	,,,,		860		•		
		850		*			855		T	Marse.	Car		Glu	Agn	Ser	Asn
	Asp	Tyr	Lys	Glu	Lys	GIn	Met	Pro	гуѕ	TAT	875	Jer	Oru		Ser	880
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	Pro	Glu	Gln	Asp	Leu	Lys	Leu	Thr	Ser	GIU	GIU	GIU	Ser	GIII	Arg	DCu .
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	Glu	Gly	Ser	Glu	Asn	Gly	Gln	Pro	Glu	Leu	Glu	Asn	Pne	Met	Ala	116
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	Glu	Glu	Met	Lys	Lys	His	Gly	Ser	Thr	His	Val	Gly	Phe	Pro	Glu	Asn
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	Léu	Thr	Asn	Glv	Ala	Thr	Ala	Gly	Asn	Gly	Asp	Asp	Gly	Leu	Ile	Pro
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	Drio	Dra.	Tava	Ser	Ara	Thr	Pro	Glu	Ser	Gln	Gln	Phe	Pro	Asp	Thr	Glu
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	<b>a</b>	<b>~</b> 2		015	) DOD	Thr	Glv	TÌe	Leu	His	Asp	Glu	Ile	Leu	Ile	His
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		~3	•	980	T1.0	C111	Val	Val	Gin	Lvs	Met	Asn	Ser	Glu	Leu	Ser
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		_	995	<b>-</b> : -	T	<b>~</b> 1	Tire	700	Tle	T.en	His	Glu			Thr	Leu
	Leu			ьys	Lys	GIU	101	E Nop				102	0			
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	Arg	Glu	Glu	Ile	Ala	Met	Leu	Arg	Leu	GIU	103	5			4 . 5	1040
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	Gln	Ser	Gln	Leu	Pro	Arg	Inr	HIS	Mec	105	، ۷۵۴	014		₽	Ser 105	5
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	Gly	Lys	Trp	Cys	Сув	Arg	Cys	Phe	Pro	Cys	Сув	Arg	108	E	Gly	Dy 5
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	Ser	Asn	Val	Gly	Thr	Ser	Gly	Asp	His	Asp	Asp	ser	, Ala	Mec	Буз	Thr
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	Leu	Arg	Ser	Lys	Met	Gly	Lys	Trp	Cys	Arg	His	Cys	Pne	PIO	Cys	Cys 1120
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	Arg	Gly	Ser	Gly	Lys	Ser	: Asn	ı Val	Gly	Ala	Ser	GTA	Asp	His	Asp	Asp
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	Cvs	Phe	Pro	Cys	Cys	Arg	g Gly	, Ser	Gly	Lys	Ser	Lys	Val	Gly	Ala	Trp
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	Glv	Ast	TVI	Asr	Asr	Sea	c Ala	. Phe	Met	Glu	Pro	Arg	ŢŢ	His	Val	Arg
		117	ω .		-		117	75				116				
	G1v	, Glu	Δsr	Len	AST	Lvs	s Lev	ı His	Arg	Ala	Ala	Trp	Trr	Gly	. Lys	Val
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	118	, »		n ar	. T.O.	T14	• Val	Met	: Lev	Arc	Asr	Thr	Asp	val	. Asn	Lys:
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	Asr	ı Ser	Gli	122 1 Va]	20 L Val	Ly	s Lev	1 Leu 124	122 1 Lev 10	a Asr	Arg	J Arg	Cys	Glr 45	Leu	Asn
	Asr	ı Ser	Gli	122 1 Va]	20 L Val	Ly	s Lev	Let 124 Thi	122 1 Lev 10	a Asr	Arg	J Arg	Cys 124 3 Ala	Glr 45	Leu	
	Asr Va]	Ser Let	Glu 123 1 Asp	122 1 Val 35 2 Asi	20 L Val	L Ly	s Lev s Arg	ı Let 124 g Thi	Lev 10 10	Lev	Arg	Arg	Cys 124 3 Ala	Glr 45 a Val	Leu Gln	Asn Cys
	Asr Va]	Ser Let	Glu 123 1 Asp	122 1 Val 35 2 Asi	20 L Val	L Ly	s Lev s Arg	ı Let 124 g Thi	Lev 10 10	Lev	Arg	Arg	Cys 124 3 Ala	Glr 45 a Val	Leu Gln	Asn

126	_				127					127					-128
Asr	ı Ile	Pro	) Ası	9 Glu 128		Gly	/ Asn	Thr	Th:		ı His	Ту	Ala	11e	Tyr
Asr	ı Glu	ı Ası	Lys 130		ı Met	: Ala	Lys	Ala 130		ı Lev	ı Lev	туз	Gl _y	Ala	Asp
Ile	e Glu	1 Ser	Lys		Lys	His	Gly 132	Leu		Pro	Leu	Let 132	ı Lev		/ Val
His				s Glr		Val	Val		Phe	e Leu		Lys		Lys	Ala
Agn			. Δ1 =	Lev				C1.		. The	134				Ala
134		LAGI	,,,,,,,,	· Dec	135	n n	Lyr	GIY	. ALC		55 5			Leu	
		Cve	. Glv	. Ser		Ser	Tla	Val	Car	Lev	i Tavi	Ton		01 <b>-</b>	1360 Asn
	7 -	. 0,1	, ,,	136		· OCI	110		137			Leu			
Ile	Asr	Val	Ser			Agn	T.e.n				Thr	- הות	 N~~~	137	Tyr
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Ala	Val	Ser			His	Hig	Val	Tle	Cvo	Gla	i. Tan	T av	133	U 	Tyr
		139	5			1115	140	U 116	Cys	GIII	Leu	140		Asp	Tyr
Lvs	Glu	Lvs	Gln	Met	Leu	Lvs	Tle	Ser	Ser	· (2) 11	Acn	140	) A a m	D~0	Glu
-1-	141	0				141		Jei	361	GIU	142		ASI	PLO	GIU
Gln			Lvs	Len	Thr				Gly	Sor	- Cln	) } 	Dho	T	Gly
142	5		,-		143		Olu	014	Giu	143					1440
		Asn	Ser				Lvs	Met	Ser			Dro	 	T1.	Asn
				144		01,0	Lys	ince	145		GIU	PIU		145	
Lvs	Asp	Glv	Asn			Val	Glu	Ġlu			Larg	Tvo	Wig	145	Ser
-1-		1	146	0		• • • • • • • • • • • • • • • • • • • •		146	5	Hec	Lys	пуз	147	v GTM	Ser
Asn	Asn	Val	Glv	Leu	Leu	Glu	Asn	Len	Thr	Aen	Glv	17a l	. አቴ/ ጥኮ፦	ט הוג	Gly
		147					148	_		71311	·3± y	148		Ald	GLY
Asn	Glv			Glv	Leu	Ile			Ara	Lvg	Ser	Ara	Thr ⊃	Dro	Glu
	149	0.		₹-2		149				-75			1111	PIU	GIU
Asn			Phe	Pro	Asp			Ser	Glu	Glu	Tvr	Hie	Ara	TIA	Cyre
150	5				151	0				151	-1- 5		,,,,	110	1520
Glu	Leu	Val	Ser	Asp	Tyr	Lvs	Glu	Lvs	Gln	Met	Pro	Lvs	Tyr	Ser	Ser
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Glu	Asn	Ser	Asn	Pro	Glu	Gln	Asp	Leu	Lys	0 Leu	Thr	Ser	Glu	Glu	Glu
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Ser	Gln	Arg	Leu	Glu	Gly	Ser	Glu	Asn	Gly	Gln	Pro	Glu	Lvs	Arg	Ser
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Gln	Glu	Pro	Glu	Ile	Asn	Lys	Asp	Gly	Asp	Arg	Glu	Leu	Glu	Asn	Phe
• •	157	0	-	*		1575	5	_	-	_	1580		7		
Met	Ala	Ile	Glu	Glu	Met	Lys	Lys	His	Gly	Ser	Thr	His	Val	Glv	Phe
1589	5.				1590	) .				1599	5		_		1600
Pro	Glu.	Asn	Leu	Thr	Asn	Gly	Ala	Thr	Ala	Gly	Asn	Gly	Asp	Asp	Gly
				160	5				1610	0				1615	5
Leu	Ile	Pro	Pro	Arg	Lys	Ser	Arg	Thr			Ser	Gln	Gln	Phe	Pro
			1620		_	11	, -	1625		-			1630		-,
Asp	Thr	Glu	Asn	Glu	Glu	Tyr	His	Ser	Asp	Glu	Gln	Asn	Asp	Thr	Gln
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Lys	Gln	Phe	Cys	Glu	Glu	Gln	Asn	Thr	Gly	Ile	Leu	His	Asp	Glu	Ile
	1650	)		٠.		1655	;	•	•		1660				
Leu	Ile	His	Glu	Glu	Lys	Gln	Ile	Glu	Val	Val	Glu	Lvs	Met	Asn	Ser
1665	;				1670	) '				1675	, ,				1680
Glu	Leu	Ser	Leu	Ser			Lys	Glu	Lys	Asp	Ile	Leu	His	Glu	Agn
				1685	•				1690	)				1695	
Ser	Thr	Leu	Àrg			Ile	Ala	Met	Leu	Ara	Leu	Glu	Leu	Asp	Thr
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Met	Lys	His	Gln	Ser	Gln	Leu	•								
		1715													

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Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn 425 Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro-440 Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu 455 Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu 470 475 Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp 485 490 Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu ₹500 505 Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys 520 · Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly 535 540 Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser 550 555 Arg Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr 570 His Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln 580. 585 Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln 600 Ile Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys 610 620 Lys Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile 635 Ala Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu

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<212> PRT

<213> Homo sapien

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		•			165	-				170		•			175		
	Leu	His	Leu	Ala	Ser	Ala	Asn	Gly	Asn	Ser	Glu	Val	Val	Lys	Leu	Leu	
				1:00					185					100		,	
	Leu	Asp	Arg	Arg	Cys	Gln	Leu	Asn	Val	Leu	Asp	Asn	rys	гÃа	Arg	inr	
			405					200					203				
	Ala	Leu	Ile	Lys	Ala	Val	Gln	Cys	Gin.	GIU	Asp	220	cys	Ald	Den	MEC	
		210					215		744 3	T10	Dro				: Glv	Aan	
	Leu	Leu	Gļu	His	Gly	Thr	Asp	Pro	ASI	TIE	225	ASP	Giu	TYL	GLY	240	
	225		1		_ `	230		Th	N ===	Glin	Acn	Tare	T.em	Met			
	Thr	Thr	Leu	His	Tyr	Ala	IIe	ıyr	ASII	250	Asp	шуэ.	Deu		255		
	_			Leu	245		31-	7	110	Glu	Ser	Lvs	Asn	Lvs		Glv	
,	Ala	Leu	Leu	ren	lyr	GIY.	Ald	мэр	265	0,14	JU2	-1-		270			1
	-	? 	D	260 Leu	T 033	Ton	Gly	Val.	His	Glu	Gln	Lvs	Gln	Gln	Val	Val	
	Leu	Thr	275	ьeu	nen	пеп	GLY	280					285			9	Ċ
	t era	Dho	Z / 3	Ile	Taye	Lvs	Lvs	Ala	Asn	Leu	Asn	Ala.	Leu	Asp	Arg	Tyr	٠
٠	•	200			2		295					300		•			٠,
	Glv	Ara	Thr	Ala	Leu	Ile	Leu	Ala	Val	Суз	Cys	Gly	Ser	Ala	Ser	Ile	
1	ZAE					310	.0				315					320	
	Val	Ser	Leu	Leu	Leu	Glu	Gln	Asn	Ile	Asp	Val	Ser	Ser	Gln	Asp	Leu	
,					325				1.0	330	, .		-1		.333		
	Ser	Gly	Gln	_Thr	Ala	Arg	Glu	Tyr	Ala	Val	Ser	Ser	His	His	His	val	
				340					345					,350			
	Ile	Cys	Gln	Leu	Leu	Ser	Asp	Tyr	Lys	Glu	Lys	Gin	Met	Leu	гуу	ire	:.
	•, 4		355		1 1	* *		360	<b>~</b> 1 -		T		365		Ser	Glu	
	Ser	Ser	Glu	Asn	Ser	Asn	Pro	GIU	GIN	ASP	rea	- DAR	Leu	1111	061		
	-	370					375		Cor	Glu	Δen	Ser	Gln	Pro	Glu	Lvs	
	Glu	Glu	Ser	Gln	Arg	390	гув	GLY	SET	Gru	395	502				400	
	385	0		Glu	Dro	390	Tle	Δsn	Lvs	Asp		Asp	Arg	Glu	Val	Glu	
					405				2	.410					410		
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				420	.*				425					430			
	Leu	Thr	Asn	Gly	Val	Thr	Ala	Gly	Asn	Gly	Asp	Asn	Gly	Leu	Ile	Pro	Ì
			430					440			. ,		447		. '		
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		450					455			414		400					
10	Ser	Glu	Glu	ı Tyr	His	Arg	Ile	Cys	GIu	Leu	val	Ser	ASD	IYL	БУЗ	480	
	400					· 170					4/3		,				
	Lys	Glr	Met	. Pro	Lys	Tyr	Ser	Ser	Gru	490	Ser	Aou		. 014	495		
				ı Thr	485		Gl.	G) 11	Ser	Gln	Ara	Leu	Glu	Gly	Ser	Glu	
	Lev	ггуз	: Let	500		GIU	Giu	Giu	505					510			
•	, Nor		, Glr	ı Pro	· · Glu	Lvs	Ara	Ser	Gln	Glu	Pro	Glu	Ile	Asn	Lys	Asp	,
			F 4 F	• ·				<b>E20</b>	1	- 4			242	, ,			
	Gla	Agr	Arc	g Glu	. Lev	Glu	Asn	Phe	Met	Ala	Ile	Glu	Glu	Met	Lys	Lys	
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	His	Gly	, Sei	r Thr	His	val	Gly	Phe	Pro	Glu	Asr	Leu	Thr	Asn	Gly	Ala	L
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	Sei	. Asj	Gl:	u Glr	a Asr	ı Asp	Thr	Glr	Lys	Gln	1 Phe	Cys	Glu	ı Glu	GIL	LASI	1 .
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	Thi	Gl	y Ile	e Let	ı His	a Asp	o Gli	ı Ile	Lev	ı Ile	His	Glu	r GTA	ттХа	s GII		
		616					615	5				620	) , ,				
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630
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cccctacctc tagtaaattt aagtccacct cacgttctgg catcacttgg cctttctgga 1320
tgctggacac ctgaagcttg gaactcacct ggccgaagct cgagcctcct gagtcctact 1380
gacctgtgct ttctggtgtg gagtccaggg ctgctaggaa aaggaatggg cagacacagg 1440
tgtatgccaa tgtttctgaa atgggtataa tttcgtcctc tccttcggaa cactggctgt 1500
ctctgaagac ttctcgctca gtttcagtga ggacacacac aaagacgtgg gtgaccatgt 1560
tgtttgtggg gtgcagagat gggaggggtg gggcccaccc tggaagagtg gacagtgaca 1620
caaggtggac actetetaca gateactgag gataagetgg agecacaatg catgaggeac 1680
acacacagca aggitgacge tgtaaacata geceaegetg teetggggge actgggaage 1740
ctagataagg ccgtgagcag aaagaagggg aggatcctcc tatgttgttg aaggagggac 1800
tagggggaga aactgaaagc tgattaatta caggaggttt gttcaggtcc cccaaaccac 1860
cgtcagattt gatgatttcc tagcaggact tacagaaata aagagctatc atgctgtggt 1920
ttattatggt ttgttacatt gataggatac atactgaaat cagcaaacaa aacagatgta 1980
tagattagag tgtggagaaa acagaggaaa acttgcagtt acgaagactg gcaacttggc 2040
```

```
tttactaagt tttcagactg gcaggaagtc aaacctatta ggctgaggac cttgtggagt 2100
gtagctgatc cagctgatag aggaactagc caggtggggg cctttccctt tggatggggg 2160
gcatatccga cagttattct ctccaagtgg agacttacgg acagcatata attctccctg 2220
caaggatgta tgataatatg tacaaagtaa ttccaactga ggaagctcac ctgatcctta 2280
gtgtccaggg tttttactgg gggtctgtag gacgagtatg gagtacttga ataattgacc 2340
tgaagtcctc agacctgagg ttccctagag ttcaaacaga tacagcatgg tccagagtcc 2400
cagatgtaca aaaacaggga ttcatcacaa atcccatctt tagcatgaag ggtctggcat 2460
ggcccaaggc cccaagtata tcaaggcact tgggcagaac atgccaagga atcaaatgtc 2520
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gcagggctgc tgagtcaacc ttttattgta caggggatga gggaaaggga gaggatgagg 2640
aageeeect ggggatttgg tttggtettg tgatcaggtg gtetatgggg etatceetac 2700
aaagaagaat ccagaaatag gggcacattg aggaatgata ctgagcccaa agagcattca 2760
atcattgttt tatttgcctt cttttcacac cattggtgag ggagggatta ccaccctggg 2820
gttatgaaga tggttgaaca ccccacacat agcaccggag atatgagatc aacagtttct 2880
tagecataga gatteacage ceagageagg aggaegetge acaccatgea ggatgacatg 2940
ggggatgcgc tcgggattgg tgtgaagaag caaggactgt tagaggcagg ctttatagta 3000
acaagacggt ggggcaaact ctgatttccg tgggggaatg tcatggtctt gctttactaa 3060
gttttgagac tggcaggtag tgaaactcat taggctgaga accttgtgga atgcagctga 3120
eccagetgat agaggaagta gecaggtggg ageettteee agtgggtgtg ggacatatet 3180
ggcaagattt tgtggcactc ctggttacag atactggggc agcaaataaa actgaatctt 3240
gttttcagac cttaaaaaaa aaaaaaaaaa aaaagtttt
<210> 383
<211> 154
<212> PRT
<213> Homo sapiens
 <400> 383
Met Ala Gly Val Arg Asp Gln Gly Gln Gly Ala Arg Trp Pro His Thr
Gly Lys Arg Gly Pro Leu Leu Gln Gly Leu Thr Trp Ala Thr Gly Gly
             20
His Cys Phe Ser Ser Glu Glu Ser Gly Ala Val Asp Gly Ala Gly Gln
 Lys Lys Asp Arg Ala Trp Leu Arg Cys Pro Glu Ala Val Ala Gly Phe
                          55
 Pro Leu Gly Ser Asp Cys Arg Glu Gly Gly Arg Gln Gly Cys Gly Gly
 Ser Asp Asp Glu Asp Asp Leu Gly Val Ala Pro Gly Leu Ala Pro Ala
 Trp Ala Leu Thr Gln Pro Pro Ser Gln Ser Pro Gly Pro Gln Ser Leu
                                 105
 Pro Ser Thr Pro Ser Ser Ile Trp Pro Gln Trp Val Ile Leu Ile Thr
         115
 Glu Leu Thr Ile Pro Ser Pro Ala His Gly Pro Pro Trp Leu Pro Asn
                         135
 Ala Leu Glu Arg Gly His Leu Val Arg Glu
```

```
<210> 384
 <211> 557
 <212> DNA
 <213> Homo sapiens
<400> 384
ggatceteta gageggeege etaetaetae taaattegeg geegegtega egaagaagag 60
aaagatgtgt tttgttttgg actetetgtg gteeetteea atgetgtggg tttccaacca 120
ggggaagggt cecttttgca ttgccaagtg ccataaccat gagcactact ctaccatggt 180
tetgeeteet ggeeaageag getggtttge aagaatgaaa tgaatgatte tacagetagg 240
acttaacctt gaaatggaaa gtcttgcaat cccatttgca ggatccgtct gtgcacatgc 300
ctctgtagag agcagcattc ccagggacct tggaaacagt tggcactgta aggtgcttgc 360
tececaagae acateetaaa aggtgttgta atggtgaaaa egtetteett etttattgee 420
ccttcttatt tatgtgaaca actgtttgtc tttttttgta tcttttttaa actgtaaagt 480
tcaattgtga aaatgaatat catgcaaata aattatgcga ttttttttc aaagtaaaaa 540
aaaaaaaaa aaaaaaa
<210> 385
<211> 337
<212> DNA
<213> Homo sapiens
<400> 385
ttcccaggtg atgtgcgagg gaagacacat ttactatect tgatggggct gattecttta 60
gtttctctag cagcagatgg gttaggagga agtgacccaa gtggttgact cctatgtgca 120
teteaaagee atetgetgte ttegagtaeg gacacateat eacteetgea ttgttgatea 180
aaacgtggag gtgcttttcc tcagctaaga agcccttagc aaaagctcga atagacttag 240
tateagaeag gteeagttte egeaceaaca cetgetggtt ceetgtegtg gtetggatet 300
ctttggccac caattccccc ttttccacat cccggca
<210> 386
<211> 300
<212> DNA
<213> Homo sapiens
gggcccgcta ccggcccagg ccccgcctcg cgagtcctcc tccccgggtg cctgcccgca 60
geeegetegg eeeagagggt gggegegggg etgeetetae eggetggegg etgtaaetea 120
gcgaccttgg cccgaagget ctagcaagga cccaccgacc ccagccgcgg cggcggcggc 180
geggaetttg eeeggtgtgt ggggeggage ggaetgegtg teegeggaeg ggeagegaag 240
atgitageet tegetgeeag gacegiggae egateecagg geigiggigt aaceicagee 300
<210> 387
<211> 537
<212> DNA
<213> Homo sapiens
<400> 387
gggccgagtc gggcaccaag ggactctttg caggcttect tecteggatc atcaaggetg 60
ecceptects typeateats at agraect at gasttegs caaaagette ttecagage 120
tgaaccagga ceggettetg ggeggetgaa aggggeaagg aggeaaggae eeegtetete 180
ccacggatgg ggagaggca ggaggagacc cagccaagtg ccttttcctc agcactgagg 240
gaggggett gttteeette ceteceggeg acaageteea gggeaggget gteeetetgg 300
gcggcccagc acttectcag acacaactte tteetgetge tecagtegtg gggateatea 360
ettacceace ceceaagtte aagaccaaat ettecagetg eeeeettegt gttteeetgt 420
gtttgctgta gctgggcatg tctccaggaa ccaagaagcc ctcagcctgg tgtagtctcc 480
ctgaccettg ttaatteett aagtetaaag atgatgaact teaaaaaaaa aaaaaaa
```

```
<210> 388
<211> 520
<212> DNA
<213> Homo sapiens
<400> 388
aggataattt ttaaaccaat caaatgaaaa aaacaaacaa acaaaaaagg aaatgtcatg 60
tgaggttaaa ccagtttgca ttcccctaat gtggaaaaag taagaggact actcagcact 120
gtttgaagat tgcctcttct acagcttctg agaattgtgt tatttcactt gccaagtgaa 180
ggacccctc cccaacatgc cccagcccac ccctaagcat ggtcccttgt caccaggcaa 240
ccaggaaact gctacttgtg gacctcacca gagaccagga gggtttggtt agctcacagg 300
actteccca ecceagaaga ttagcatece atactagaet catacteaac teaactagge 360
tcatactcaa ttgatggtta ttagacaatt ccatttcttt ctggttatta taaacagaaa 420
atettteete tteteattae cagtaaagge tettggtate tttetgttgg aatgatttet 480
atgaacttgt cttattttaa tggtgggttt tttttctggt
<210> 389
<211> 365
<212> DNA
<213> Homo sapiens
<400> 389
cgttgcccca gtttgacaga aggaaaggcg gagcttattc aaagtctaga gggagtggag 60
gagttaagge tggattteag atetgeetgg tteeageege agtgtgeeet etgeteeece 120
aacgactttc caaataatct caccagegee ttecagetca ggegteetag aagegtettg 180
aagectatgg ceagetgtet ttgtgtteee teteaceege etgteeteae agetgagaet 240
cccaggaaac cttcagacta ccttcctctg ccttcagcaa ggggcgttgc ccacattctc 300
tgagggtcag tggaagaacc tagactccca ttgctagagg tagaaagggg aagggtgctg 360
gggag
<210> 390
<211> 221
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(221)
<223> n = A,T,C or G
<400> 390
tgeeteteca teetggeece gaettetetg teaggaaagt ggggatggae eccatetgea 60
tacacggntt ctcatgggtg tggaacatct ctgcttgcgg tttcaggaag gcctctggct 120
getetangag tetganenga ntegttgece cantntgaca naaggaaagg eggagettat 180
tcaaagtcta gagggagtgg aggagttaag gctggatttc a
 <210> 391
 <211> 325
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(325)
 <223> n = A, T, C \text{ or } G
 <400> 391
```

```
tggagcaggt cccgaggcct ccctagagcc tggggccgac tctgtgncga tgcangcttt 60
ctctcgcgcc cagcctggag ctgctcctgg catctaccaa caatcagncg aggcgagcag 120
tagccagggc actgctgcca acagccagtc cnnataccat catgtnaccc qqtqnqctct 180
naantingat niccanagee etacecaten tagitetget eteceaeegg niaeeageee 240
cactgoccag gaatcctaca gocagtaccc tgtcccgacg tctctaccta ccagtacgat 300
gagacctccg gctactacta tgacc
<210> 392
<211> 277
<212> DNA
 <213> Homo sapiens
<220>
<221> misc feature
<222> (1) ... (277)
<223> n = A,T,C or G
<400> 392
atattgttta actoottoot ttatatottt taacatttto atggngaaag gttcacatot 60
agteteaett nggenagngn etectaettg agtetettee eeggeetgnn eeagtngnaa 120
antaccanga accgncatgn cttaanaacn nectggtttn tgggttnntc aatgactgca 180
tgcagtgcac caccetgtee actaegtgat getgtaggat taaagtetea cagtgggegg 240
ctgaggatac agcgccgcgt cctgtgttgc tggggaa
<210> 393
<211> 566
<212> DNA
<213> Homo sapiens
<400> 393
actagtocag tgtggtggaa ttegeggeeg egtegaegga eaggteaget gtetggetea 60
gtgatctaca ttctgaagtt gtctgaaaat gtcttcatga ttaaattcag cctaaacgtt 120
ttgccgggaa cactgcagag acaatgctgt gagtttccaa ccttagccca tctgcgggca 180
gagaaggtct agtttgtcca tcagcattat catgatatca ggactggtta cttggttaag 240
gaggggtcta ggagatctgt cccttttaga gacaccttac ttataatgaa gtatttggga 300
gggtggtttt caaaagtaga aatgteetgt atteegatga teateetgta aacattttat 360
catttattaa tcatccctgc ctgtgtctat tattatattc atatctctac gctggaaact 420
cattetetge etgageteta attetegece aaagetatet taatetatae aattaaaage 540
ttttgcctat caaaaaaaa aaaaaa
<210> 394
<211> 384
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(384)
<223> n = A, T, C or G
<400> 394
gaacatacat gtcccggcac ctgagctgca gtctgacatc atcgccatca cgggcctcgc 60
tgcaaattng gaccgggcca aggctggact gctggagcgt gtgaaggagc tacaggccna 120
gcaggaggac cgggctttaa ggagttttaa gctgagtgtc actgtagacc ccaaatacca 180
teccaagatt ategggagaa agggggeagt aattacecaa ateeggttgg ageatgaegt 240
gaacatccag tttcctqata aggacgatgg gaaccagccc caggaccaaa ttaccatcac 300
agggtacgaa aagaacacag aagctgccag ggatgctata ctgagaattg tgggtgaact 360
```

```
384
tgagcagatg gtttctgagg acgt
<210> 395
<211> 399
<212> DNA
<213> Homo sapiens
<400> 395
ggcaaaactg tgtgacctca ataagacctc gcagatccaa ggtcaagtat cagaagtgac 60
totgacettg gactocaaga cotacatoaa cagootggot atattagatg atgagocagt 120
tatcagaggt ttcatcattg cggaaattgt ggagtctaag gaaatcatgg cctctgaagt 180
atteacgtet ttecagtace etgagttete tatagagttg cetaacacag geagaattgg 240
ccagctactt gtctgcaatt gtatcttcaa gaataccctg gccatccctt tgactgacgt 300
caagttetet ttggaaagee tgggeatete etcactacag acetetgaee atgggaeggt 360
gcagcctggt gagaccatcc aatcccaaat aaaatgcac
<210> 396
<211> 403
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(403)
<223> n = A, T, C or G
<400> 396
tggagttntc agtgcaaaca agccataaag cttcagtagc aaattactgt ctcacagaaa 60
gacattttca acttctgctc cagctgctga taaaacaaat catgtgttta gcttgactcc 120
agacaaggac aacctgttcc ttcataactc tctagagaaa aaaaggagtt gttagtagat 180
actaaaaaaa gtggatgaat aatctggata tttttcctaa aaagattcct tgaaacacat 240
taggaaaatg gagggcctta tgatcagaat gctagaatta gtccattgtg ctgaagcagg 300
gtttagggga gggagtgagg gataaaagaa ggaaaaaaag aagagtgaga aaacctattt 360
atcaaagcag gtgctatcac tcaatgttag gccctgctct ttt.
 <210> 397
 <211> 100
<212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(100)
 <223> n = A,T,C or G
 <400> 397
 actagineag tgiggiggaa tiegeggeeg egiegaeeta naaneeatet etatageaaa 60
 tecatececg etectggttg gtnacagaat gactgacaaa
 <210> 398
 <211> 278
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc feature
 <222> (1)...(278)
 <223> n = A,T,C or G
```

```
<400> 398
 geggeegegt egacageagt teegeeageg etegeeeetg ggtggggatg tgetgeacge 60
 ccacctggac atctggaagt cagcggcctg gatgaaagag cggacttcac ctggggcgat 120
 tcactactgt gcctcgacca gtgaggagag ctggaccgac agcgaggtgg actcatcatg 180
 ctccgggcag cccatccacc tgtggcagtt cctcaaggag ttgctactca agccccacag 240
 ctatggccgc ttcattangt ggctcaacaa ggagaagg
 <210> 399
 <211> 298
 <212> DNA
 <213> Homo sapiens
  F
 <220>
 <221> misc_feature
 <222> (1)...(298)
 \langle 223 \rangle n = A,T,C or G
 <400> 399
 acggaggtgg aggaagcgnc cctgggatcg anaggatggg tcctgncatt gaccncctcn 60
 ggggtgceng catggagege atgggegegg geetgggeea eggeatggat egegtggget 120
 ccgagatcga gcgcatgggc ctggtcatgg accgcatggg ctccgtggag cgcatgggct 180
 ccggcattga gcgcatgggc ccgctgggcc tcgaccacat ggcctccanc attgancgca 240
 tgggccagac catggagege attggetetg gegtggagen catgggtgee ggcatggg
 <210> 400
 <211> 548
 <212> DNA
 <213> Homo sapiens
<400> 400
acatcaacta cttcctcatt ttaaggtatg gcagttccct tcatcccctt ttcctgcctt 60
gtacatgtac atgtatgaaa tttccttctc ttaccgaact ctctccacac atcacaaggt 120
caaagaacca cacgettaga agggtaagag ggcaccetat gaaatgaaat ggtgatttet 180
tgagtctctt ttttccacgt ttaaggggcc atggcaggac ttagagttgc gagttaagac 240
tgcagagggc tagagaatta tttcatacag gctttgaggc cacccatgtc acttatcccg 300
tataccetet caccatecce ttgtetacte tgatgecece aagatgeaac tgggcageta 360
gttggcccca taattctggg cctttgttgt ttgttttaat tacttgggca tcccaggaag 420
etttecagtg atetectace atgggeeece etectgggat caageceete ecaggeeetg 480
tecceagece etectgeece ageceaeceg ettgeettgg tgeteagece teccattggg 540
agcaggtt
                                                                    548
<210> 401
<211> 355
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) . . . (355)
<223> n = A,T,C or G
<400> 401
actgtttcca tgttatgttt ctacacattg ctacctcagt gctcctggaa acttagcttt 60
tgatgtctcc aagtagtcca cettcattta actetttgaa actgtatcat etttgccaag 120
taagagtggt ggcctatttc agctgctttg acaaaatgac tggctcctga cttaacgttc 180
tataaatgaa tgtgctgaag caaagtgccc atggtggcgg cgaagaagan aaagatgtgt 240
tttgttttgg actctctgtg gtcccttcca atgctgnggg tttccaacca ggggaagggt 300
```

```
ccettttgca ttgccaagtg ccataaccat gagcactact ctaccatggn tctgc
                                                                   355
<210> 402
<211> 407
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) ... (407)
<223> n = A,T,C \text{ or } G
atggggcaag ctggataaag aaccaagacc cactggagta tgctgtcttc aagaaaccca 60
tctcacatgc ggtggcatac ataggctcaa aataaaggaa tggagaaaaa tatttcaagc 120
aaatggaaaa cagaaaaaag caggtgttgc actcctactt tctgacaaaa cagactatgc 180
gaataaagat aaaaaagaga aggacattac aaaggtggtc ctgacctttg ataaatctca 240
ttgcttgata ccaacctggg ctgttttaat tgcccaaacc aaaaggataa tttgctgagg 300
ttgtggaget teteceetge agagagteee tgateteeca aaatttggtt gagatgtaag 360
gntgattttg ctgacaactc cttttctgaa gttttactca tttccaa
 <210> 403
 <211> 303
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) ... (303)
 <223> n = A,T,C or G
 <400> 403
 cagtatttat agccnaactg aaaagctagt agcaggcaag tetcaaatcc aggcaccaaa 60
 tectaageaa gageeatgge atggtgaaaa tgeaaaagga gagtetggee aatetacaaa 120
 tagagaacaa gacctactca gtcatgaaca aaaaggcaga caccaacatg gatctcatgg 180
 gggattggat attgtaatta tagagcagga agatgacagt gatcgtcatt tggcacaaca 240
 tettaacaac gaccgaaace cattatttac ataaacetee atteggtaac catgttgaaa 300
 gga
 <210> 404
 <211> 225
 <212> DNA
 <213> Homo sapiens
 <400> 404
 aagtgtaact tttaaaaatt tagtggattt tgaaaattct tagaggaaag taaaggaaaa 60
 attgttaatg cactcattta cctttacatg gtgaaagttc tctcttgatc ctacaaacag 120
 acattttcca ctcgtgtttc catagttgtt aagtgtatca gatgtgttgg gcatgtgaat 180
 ctccaagtgc ctgtgtaata aataaagtat ctttatttca ttcat
 <210> 405
  <211> 334
  <212> DNA
  <213> Homo sapiens
  <220>
  <221> misc feature
 <222> (1) ... (334)
```

```
<223> n = A,T,C or G
 <400> 405
 gagetgttat actgtgagtt ctactaggaa atcatcaaat ctgagggttg tctggaggac 60
 ttcaatacac ctccccccat agtgaatcag cttccagggg gtccagtccc tctccttact 120
 teatececat eccatgeeaa aggaagaeee teeeteettg geteacagee ttetetagge 180
 ttcccagtgc ctccaggaca gagtgggtta tgttttcagc tccatccttg ctgtgagtgt 240
 ctggtgcggt tgtgcctcca gcttctgctc agtgcttcat ggacagtgtc cagcccatgt 300
 cactetecae teteteanng tggateceae eeet
 <210> 406
 <211> 216
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(216)
 <223> n = A, T, C or G.
 <400> 406
 tttcatacct aatgagggag ttganatnac atnnaaccag gaaatgcatg gatctcaang 60
gaaacaaaca cccaataaac teggagtggc agactgacaa ctgtgagaca tgcacttgct 120
acnaaacaca aatttnatgt tgcacccttg tttctacacc tgtgggttat gacaaagaca 180
actgccaaag aatnttcaag aaggaggact-gccant-
<210> 407
<211> 413
<212> DNA
<213> Homo sapiens
<400> 407
getgaettge tagtateate tgeatteatt gaageacaag aactteatge ettgaeteat 60
gtaaatgcaa taggattaaa aaataaattt gatatcacat ggaaacagac aaaaaatatt 120
gtacaacatt gcacccagtg tcagattcta cacctggcca ctcaggaagc aagagttaat 180
cccagaggtc tatgtcctaa tgtgttatgg caaatggatg tcatgcacgt accttcattt 240
ggaaaattgt catttgtcca tgtgacagtt gatacttatt cacatttcat atgggcaacc 300
tgccagacag gagaaagtct tcccatgtta aaagacattt attatcttgt tttcctgtca 360
tgggagttcc agaaaaagtt aaaacagaca atgggccagg ttctgtagta aag
<210> 408
<211> 183
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature ...
<222> (1) ... (183)
<223> n = A,T,C \text{ or } G
<400> 408
ggagctngcc ctcaattcct ccatntctat gttancatat ttaatgtctt ttgnnattaa 60
tnettaacta gttaateett aaagggetan ntaateetta actagteeet ceattgtgag 120
cattatectt ccagtatten cettetnttt tatttactee tteetggeta eccatgtact 180
<210> 409
```

<211> 250

```
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(250)
<223> n = A,T,C or G
<400> 409
cccacgcatg ataagctctt tatttctgta agtcctgcta ggaaatcatc aaatctgacg 60
gtggtttggg ggacctgaac aaacctcctg taattaatca gctttcagtt tctcccccta 120
gteeeteett caacaacata ggaggateet eccettettt etgeteaegg cettatetag 180
getteecagt geecceagga cagegtggge tatgtttaca gegenteett getggggggg 240
ggccntatgc
<210> 410
<211> 306
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(306)
<223> n = A, T, C or, G
ggctggtttg caagaatgaa atgaatgatt ctacagctag gacttaacct tgaaatggaa 60
agtettgeaa teccatttge aggateegte tgtgeacatg cetetgtaga gageageatt 120
cccagggacc ttggaaacag ttggcactgt aaggtgcttg ctccccaaga cacatcctaa 180
aaggtgttgt aatggtgaaa accgcttcct tctttattgc cccttcttat ttatgtgaac 240
nactggttgg ctttttttgn atcttttta aactggaaag ttcaattgng aaaatgaata 300
tentge
<210> 411
 <211> 261
<212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) . . . (261)
 \langle 223 \rangle n = A,T,C or G
 <400> 411
 agagatattn ettaggtnaa agtteataga gtteecatga aetatatgae tggeeacaea 60
 ggatettttg tatttaagga ttetgagatt ttgettgage aggattagat aaggetgtte 120
 tttaaatgtc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
 aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
 cttctctcaa ggngaggcaa a
 <210> 412
 <211> 241
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) . . . (241)
```

```
<223> n = A, T, C \text{ or } G
 <400> 412
 gttcaatgtt acctgacatt tctacaacac cccactcacc gatgtattcg ttgcccagtg 60
 ggaacatacc agcctgaatt tggaaaaaat aattgtgttt cttgcccagg aaatactacg 120
 actgactttg atggctccac aaacataacc cagtgtaaaa acagaagatg tggaggggag 180
 ctgggagatt tcactgggta cattgaattc ccaaactacc cangcaatta cccagccaac 240
 <210> 413
 <211> 231
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc feature
<222> (1) . . . (231)
 \langle 223 \rangle n = A,T,C or G
 <400> 413
aactettaca atccaagtga ctcatctgtg tgcttgaate ctttccactg tctcatctcc 60
ctcatccaag tttctagtac cttctctttg ttgtgaagga taatcaaact gaacaacaaa 120
aagtttactc teeteatttg gaacetaaaa actetettet teetgggtet gagggeteea 180
agaateettg aateanttet cagateattg gggacacean ateaggaace t
<210> 414
<211> 234
<212> DNA
<213> Homo sapiens
<400> 414
actgtccatg aagcactgag cagaagctgg aggcacaacg caccagacac tcacagcaag 60
gatggagetg aaaacataac ccactetgte etggaggcac tgggaageet agagaagget 120
gtgagccaag gagggagggt cttcctttgg catgggatgg ggatgaagta aggagaggga 180
ctggaccccc tggaagctga ttcactatgg ggggaggtgt attgaagtcc tcca
<210> 415
<211> 217
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(217)
<223> n = A, T, C or G
<400> 415
gcataggatt aagactgagt atcttttcta cattctttta actttctaag gggcacttct 60
caaaacacag accaggtage aaatetecae tgetetaagg nteteaceae caetttetea 120
cacctagcaa tagtagaatt cagteetaet tetgaggeea gaagaatggt teagaaaaat 180
antggattat aaaaaataac aattaagaaa aataatc
<210> 416
<211> 213
<212> DNA
<213> Homo sapiens
<220>
```

```
<221> misc_feature
<222> (1) ...(213)
<223> n = A,T,C \text{ or } G
<400> 416
atgeatatnt aaagganact geetegettt tagaagaeat etggnetget etetgeatga 60
ggcacagcag taaagctett tgatteccag aatcaagaac teteccette agactattae 120
cgaatgcaag gtggttaatt gaaggccact aattgatgct caaatagaag gatattgact 180
atattggaac agatggagtc tctactacaa aag
<210> 417
<211> 303
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(303)
<223> n = A, T, C or G
<400>_417____
nagtetteag geceateagg gaagtteaca etggagagaa gteataeata tgtaetgtat 60
gtgggaaagg ctttactctg agttcaaatc ttcaagccca tcagagagtc cacactggag 120
agaagccata caaatgcaat gagtgtggga agagcttcag gagggattcc cattatcaag 180
ttcatctagt ggtccacaca ggagagaaac cctataaatg tgagatatgt gggaagggct 240
tcantcaaag ttcgtatctt caaatccatc ngaaggncca cagtatanan aaacctttta 300
agt
<210> 418
<211> 328
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(328)
\langle 223 \rangle n = A,T,C or G
<400> 418
tttttggcgg tggtggggca gggacgggac angagtctca ctctgttgcc caggctggag 60
tgcacaggca tgatctcggc tcactacaac ccctgcctcc catgtccaag cgattcttgt 120
geetcageet teeetgtage tagaattaca ggeacatgee accacaceca getagttttt 180
gtatttttag tagagacagg gtttcaccat gttggccagg ctggtctcaa actcctnacc 240
tragnggtra ggetggtrte aaacteetga cetraagtga tetgeccare tragectree 300.
                                                                    328
aaagtgctan gattacaggc cgtgagcc
 <210> 419
 <211> 389
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(389)
 <223> n = A,T,C or G
 cetecteaag aeggeetgtg gteegeetee eggeaaceaa gaageetgea gtgeeatatg 60
```

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```
accectgage catggactgg agectgaaag geagegtaca eeetgeteet gatettgetg 120
 ettgttteet etetgtgget ceatteatag cacagttgtt geaetgagge ttgtgcagge 180
 cqaqcaaqqc caaqctggct caaaqaqcaa ccaqtcaact ctgccacqqt qtqccaqqca 240
 cognition agreement circumstate confidence agreement to the confidence agreement agree
 taaaggtagg accaaagggc atctgetttt ctgaagteet etgetetate agceateaeg 360
 tggcagccac tenggetgtg tegacgegg
 <210> 420
 <211> 408
 <212> DNA
 <213> Homo sapiens
 <400> 420
gtteeteeta aeteetgeea gaaacagete teeteaacat gagagetgea ecceteetee 60
tggccagggc agcaagcett agcettgget tettgtttet getttttte tggctagace 120
gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
gteccattga cacetttece actgacecca taaaggaate etcatggeca caaggatttg 240
gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attettgaat gagteetata aacatgaaca ggtttatatt cgaagcacag 360
acgttgaccg gactttgatg aagtgctatg acaaacctgg caagcccg
 <210> 421
 <211>. 352
 <212> DNA
 <213> Homo sapiens
<220>
<221> misc feature
<222> (1) . . . (352)
<223> n = A, T, C \text{ or } G
<400> 421
geteaaaaat etttttaetg atnggeatgg etacacaate attgaetatt aeggaggeea 60
gaggagaatg aggeetggee tgggageeet gtgeetaeta naageacatt agattateea 120
ttcactgaca gaacaggtet tttttgggte ettettetee accaenatat acttgeagte 180
etectiettg aagattetti ggeagtigte titgteataa eecacaggig tagaaacaag 240
ggtgcaacat gaaatttetg tttegtagca agtgcatgte teacaagttg gcangtetge 300
cacteegagt ttattgggtg tttgttteet ttgagateea tgeattteet gg
<210> 422
<211> 337
<212> DNA
<213> Homo sapiens
atgecaccat getggeaatg cagegggegg tegaaggeet geatatecag cecaagetgg 60
cgatgatcga cggcaaccgt tgcccgaagt tgccgatgcc agccgaagcg gtggtcaagg 120
gegatageaa ggtgceggeg ategeggegg cgtcaateet ggccaaggte ageegtgate 180
gtgaaatggc agctgtcgaa ttgatctacc cgggttatgg catcggcggg cataagggct 240
atcogacaco ggtgcacctg gaagcottgc agoggotggg googacgcog attoaccgac 300
gettetteeg eeggtaegge tggeetatga aaattat
<210> 423
<211> 310
<212> DNA
<213> Homo sapiens
```

<220>

```
<221> misc_feature
<222> (1) ... (310)
<223> n = A,T,C \text{ or } G
<400> 423
gctcaaaaat ctttttactg atatggcatg gctacacaat cattgactat tagaggccag 60
aggagaatga ggcctggcct gggagccctg tgcctactan aagcncatta gattatccat 120
teactgacag aacaggtett ttttgggtee ttetteteea ecaegatata ettgeagtee 180
teettettga agattetttg geagttgtet ttgteataac ceacaggtgt anaaacaagg 240
gtgcaacatg aaatttctgt ttcgtagcaa gtgcatgtct cacagttgtc aagtctgccc 300
tccgagttta
<210> 424
<211> 370
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(370)
<223> n = A,T,C or G
<400> 424
geteaaaaat etttttaetg ataggeatgg etacacaate attgaetatt agaggeeaga 60
ggagaatgag geetggeetg ggageeetgt geetaetaga agcacattag attatecatt 120
cactgacaga acaggictit titgggicci tettetecae cacgatatae tigcagicci 180
cettettgaa gattetttgg cagttgtett tgtcataace cacaggtgta gaaacateet 240
ggttgaatct cctggaactc cctcattagg tatgaaatag catgatgcat tgcataaagt 300
cacgaaggtg gcaaagatca caacgctgcc cagganaaca ttcattgtga taagcaggac 360
tccgtcgacg
<210> 425
<211> 216
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(216)
<223> n = A,T,C or G
<400> 425
taacaacnca acatcaaggn aaananaaca ggaatggntg actntgcata aatnggccga 120
anattateca ttatnttaag ggttgaette aggntacage acacagacaa acatgeecag 180
gaggntntca ggaccgctcg atgtnttntg aggagg
 <210> 426
 <211> 596
 <212> DNA
 <213> Homo sapiens
 <400> 426
cttccagtga ggataaccct gttgccccgg gccgaggttc tccattaggc tctgattgat 60
 tggcagtcag tgatggaagg gtgttctgat cattccgact gccccaaggg tcgctggcca 120
getetetgtt ttgetgagtt ggeagtagga cetaatttgt taattaagag tagatggtga 180
getgteettg tattttgatt aacctaatgg cetteecage acgaetegga tteagetgga 240
 gacatcacgg caacttttaa tgaaatgatt tgaagggcca ttaagaggca cttcccgtta 300
```

```
ttaggcagtt catctgcact gataacttct tggcagctga gctggtcgga gctgtggccc 360
 aaacgcacac ttggcttttg gttttgagat acaactctta atcttttagt catgcttgag 420
 ggtggatggc cttttcagct ttaacccaat ttgcactgcc ttggaagtgt agccaggaga 480
 atacacteat atactegtgg gettagagge cacageagat gteattggte tactgeetga 540
 gtecegetgg teceatecea ggacetteca teggegagta cetgggagee egtget
 <210> 427
 <211> 107
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(107)
 <223> n = A,T,C \text{ or } G
 <400> 427
 gaagaattca agttaggttt attcaaaggg cttacngaga atcctanacc caggncccag 60
cccgggagca gccttanaga gctcctgttt gactgcccgg ctcagng
<210> 428
 <211> 38.
 <212> DNA
 <213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(38)
<223> n = A,T,C or G
gaactteena anaangaett tatteactat tttacatt
                                                                    38
<210> 429
<211> 544
<212> DNA
<213> Homo sapiens
ctttgctgga cggaataaaa gtggacgcaa gcatgacctc ctgatgaggg cgctgcattt 60
attgaagage ggetgeagee etgeggttea gattaaaate egagaattgt atagaegeeg 120
atatecaega actettgaag gaetttetga tttatecaea ateaaateat eggtttteag 180
tttggatggt ggctcatcac ctgtagaacc tgacttggcc gtggctggaa tccactcgtt 240
geettecaet teagttacae eteacteace atecteteet gttggttetg tgetgettea 300
agatactaag cccacatttg agatgcagca gccatctccc ccaattcctc ctgtccatcc 360
tgatgtgcag ttaaaaaatc tgccctttta tgatgtcctt gatgttctca tcaagcccac 420
gagtttagtt caaagcagta ttcagcgatt tcaagagaag ttttttattt ttgctttgac 480
acctcaacaa gttagagaga tatgcatatc cagggatttt ttgccaggtg gtaggagaga 540
ttat
<210> 430
<211> 507
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature ...
<222> (1)...(507)
```

<223> n = A,T,C or G

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cttatencaa tggggeteee aaacttgget gtgeagtgga aacteegggg gaattttgaa 60
<400> 430
gaacactgac acceatette caccegaca etetgattta attgggetge agtgagaaca 120
gagcatcaat ttaaaaagct gcccagaatg ttntcctggg cagcgttgtg atctttgccn 180
cettegtgae tttatgcaat gcatcatgct atttcatace taatgaggga gttccaggag 240
atteaaccag gatgttteta encetgtggg ttatgacaaa gacaactgee aaagaatntt 300
caagaaggag gactgcaagt atatcgtggt ggagaagaag gacccaaaaa agacctgttc 360
tgtcagtgaa tggataatct aatgtgcttc tagtaggcac agggctccca ggccaggcct 420
cattetecte tggcetetaa tagteaatga ttgtgtagee atgcetatea gtaaaaagat 480
ttttgagcaa aaaaaaaaaa aaaaaaa
<210> 431
<211> 392
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) ... (392)
<223> n = A,T,C or G
gaaaattcag aatggataaa aacaaatgaa gtacaaaata tttcagattt acatagcgat 60
aaacaagaaa gcacttatca ggaggactta caaatggaag tacactctan aaccatcatc 120
tatcatgget aaatgtgaga ttagcacage tgtattattt gtacattgca aacacetaga 180
aagagatggg aaacaaaatc ccaggagttt tgtgtgtgga gtcctgggtt ttccaacaga 240
 catcattcca gcattctgag attagggnga ttggggatca ttctggagtt ggaatgttca 300
 acaaaagtga tgttgttagg taaaatgtac aacttctgga tctatgcaga cattgaaggt 360
 gcaatgagtc tggcttttac tctgctgttt ct
 <210> 432
 <211> 387
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) ... (387)
 <223> n = A,T,C or G
 ggtateenta cataateaaa tatagetgta gtacatgttt teattggngt agattaceae 60
 aaatgcaagg caacatgtgt agatetettg tettattett ttgtetataa tactgtattg 120
 ngtagtecaa geteteggna gtecagecae tgngaaacat getecettta gattaacete 180
 gtggacnetn ttgttgnatt gtctgaactg tagngccctg tattttgctt ctgtctgnga 240
 attetgttgc ttetggggca ttteettgng atgeagagga ceaceacaca gatgaeagca 300
 atctgaattg ntccaatcac agctgcgatt aagacatact gaaatcgtac aggaccggga 360
 acaacgtata gaacactgga gtccttt
 <210> 433
 <211> 281
 <212> DNA
  <213> Homo sapiens
  <221> misc_feature
```

 $\langle 222 \rangle$  (1)...(281)  $\langle 223 \rangle$  n = A,T,C or G office and

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<400> 433
 ttcaactage anagaanact gettcagggn gtgtaaaatg aaaggettee acgeagttat 60
 ctgattaaag aacactaaga gagggacaag gctagaagcc gcaggatgtc tacactatag 120
 caggenetat ttgggttgge tggaggaget gtggaaaaca tggagagatt ggegetggag 180
 ategeegtgg ctattecten ttgntattac accagngagg ntetetgtnt geceactggt 240
 tnnaaaaccg ntatacaata atgatagaat aggacacaca t
 <210> 434
 <211> 484
 <212> DNA
 <213> Homo sapiens,
 <400> 434
 ttttaaaata agcatttagt gctcagtccc tactgagtac tctttctctc ccctcctctq 60
 aatttaatte titeaacttg caatttgeaa ggattacaca ttteactgtg atgtatattg 120
 tgttgcaaaa aaaaaaaagt gtctttgttt aaaattactt ggtttgtgaa tccatcttgc 180
tttttcccca ttggaactag tcattaaccc atctctgaac tggtagaaaa acatctgaag 240
agctagtcta tcagcatctg acaggtgaat tggatggttc tcagaaccat ttcacccaga 300
cagootgttt ctatootgtt taataaatta gtttgggtto totacatgca taacaaacco 360
tgetecaate tgtcacataa aagtetgtga ettgaagttt agteageace eccaceaac 420
tttatttttc tatgtgtttt ttgcaacata tgagtgtttt gaaaataaag tacccatgtc 480
<210> 435
<211> 424
<212> DNA
<213> Homo sapiens
<400> 435
gegeegetea gageaggtea etttetgeet tecaegteet eetteaagga ageeecatgt 60
gggtagettt caatategea ggttettaet eetetgeete tataagetea aacceaceaa 120
cgatcgggca agtaaacccc ctccctcgcc gacttcggaa ctggcgagag ttcagcgcag 180
atgggcctgt ggggaggggg caagatagat gagggggagc ggcatggtgc ggggtgaccc 240
cttggagaga ggaaaaaggc cacaagaggg gctgccaccg ccactaacgg agatggccct 300
ggtagagacc tttgggggtc tggaacctct ggactcccca tgctctaact cccacactct 360
gctatcagaa acttaaactt gaggattttc tctgtttttc actcgcaata aattcagagc 420
aaac
<210> 436
<211> 667
<212> DNA
<213> Homo sapiens
<221> misc_feature
<222> (1)...(667)
<223> n = A, T, C or G
<400> 436
accttgggaa nactctcaca atataaaggg tcgtagactt tactccaaat tccaaaaagg 60
tectggecat gtaateetga aagtttteee aaggtageta taaaateett ataagggtge 120
agectettet ggaatteete tgattteaaa gteteaetet caagttettg aaaacgaggg 180
cagtteetga aaggeaggta tageaactga tetteagaaa gaggaactgt gtgeaceggg 240
atgggctgcc agagtaggat aggattccag atgctgacac cttctggggg aaacagggct 300
gecaggiting teatageact cateaaagte eggicaaegt etgigetieg aatataaaec 360
```

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tgttcatgtt tataggactc attcaagaat tttctatatc tctttcttat atactctcca 420
agttcataat getgetecat geceagetgg gtgagttgge caaateettg tggccatgag 480
gatteettta tggggteagt gggaaaggtg teaatgggae tteggtetee atgeegaaac 540
accanagtca canacttcan ctccttggct agtacacttc ggtctagcca gananaagc 600
agaaacaaga agccaaggct aaggcttgct gccctgccag gaggaggggt gcagctctca 660
tgttgag
<210> 437
<211> 693
<212> DNA
<213> Homo sapiens
<400> 437
ctacgtctca acceteattt ttaggtaagg aatettaagt ccaaagatat taagtgacte 60
acacagccag gtaaggaaag ctggattggc acactaggac tctaccatac cgggttttgt 120
taaageteag gttaggagge tgataagett ggaaggaact teagacaget tttteagate 180
ataaaagata attettagee catgitette teeagageag acetgaaatg acageacage 240
aggtactect ctattttcac coctettget tetactetet ggcagtcaga cetgtgggag 300
gccatgggag aaagcagctc tctggatgtt tgtacagatc atggactatt ctctgtggac 360
cattteteca ggttacecta ggtgteacta ttggggggac agecageate tttagettte 420
atttgagttt ctgtctgtct tcagtagagg aaacttttgc tcttcacact tcacatctga 480
acacctaact gctgttgctc-ctgaggtggt gaaagacaga tatagagctt acagtattta 540
tectatttet aggeactgag ggetgtgggg tacettgtgg tgccaaaaca gateetgttt 600
taaggacatg ttgcttcaga gatgtctgta actatctggg ggctctgttg gctctttacc 660
ctgcatcatg tgctctcttg gctgaaaatg acc
 <210> 438
 <211>: 360
 <212> DNA
 <213> Homo sapiens
 ctgcttatca caatgaatgt tctcctgggc agcgttgtga tctttgccac cttcgtgact 60
 <400> 438
 ttatgcaatg catcatgcta tttcatacct aatgaggag ttccaggaga ttcaaccagg 120
 atgtttctac acctgtgggt tatgacaaag acaactgcca aagaatcttc aagaaggagg 180
 actgcaagta tatctggtgg agaagaagga cccaaaaaag acctgttctg tcagtgaatg 240
 gataatctaa tgtgcttcta gtaggcacag ggctcccagg ccaggcctca ttctcctctg 300
 geetetaata gteaataatt gtgtageeat geetateagt aaaaagattt ttgageaaac 360
 <210> 439
 <211> 431
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc feature
 <222> (1) . . . (431)
 <223> n = A,T,C or G
 <400> 439
 gtteetnnta actectgeca gaaacagete teetcaacat gagagetgea ecceteetee 60
 tggccagggc agcaagcett agcettgget tettgtttet getttttte tggctagace 120
 gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
 gteceattga cacetttece actgacecea taaaggaate eteatggeca caaggatttg 240
 gecaactcae ecagetggge atggageage attatgaact tggagagtat ataagaaaga 300
 gatatagaaa attettgaat gagteetata aacatgaaca ggtttatatt egaageacag 360
 acgttgaccg gactttgatg agtgctatga caaacctggc agcccgtcga cgcggccgcg 420
  aatttagtag t
```

```
<210> 440
 <211> 523
 <212> DNA
 <213> Homo, sapiens
 <400> 440
 agagataaag cttaggtcaa agttcataga gttcccatga actatatgac tggccacaca 60
 ggatcttttg tatttaagga ttctgagatt ttgcttgagc aggattagat aaggctgttc 120
 tttaaatgtc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
 aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
 ctteteteaa ggagaggeaa agaaaggaga tacagtggag acatetggaa agttttetee 300
 actggaaaac tgctactatc tgtttttata tttctgttaa aatatatgag gctacagaac 360
 taaaaattaa aacctctttg tgtcccttgg tcctggaaca tttatgttcc ttttaaagaa 420
 acaaaaatca aactttacag aaagatttga tgtatgtaat acatatagca gctcttgaag 480
 tatatatatc atagcaaata agtcatctga tgagaacaag cta
 <210> 441
 <211> 430
 <212> DNA
 <213> Homo sapiens
 <400> 441
 gtteeteeta aeteetgeea gaaacagete teeteaacat gagagetgea ecceteetee 60
 tggccagggc agcaagcett agcettgget tettgtttet getttttte tggctagace 120
 gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
 gteceattga cacettteee actgaeeeea taaaggaate eteatggeea caaggatttg 240
 gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attettgaat gagteetata aacatgaaca ggtttatatt cgaagcacag 360
acgttgaccg gactttgatg agtgctatga caaacctggc agcccgtcga cgcggccgcg 420
 aatttagtag
<210> 442
<211> 362
<212> DNA
<213> Homo sapiens
<400> 442
ctaaggaatt agtagtgttc ccatcacttg tttggagtgt gctattctaa aagattttga 60
tttcctggaa tgacaattat attttaactt tggtggggga aagagttata ggaccacagt 120
cttcacttct gatacttgta aattaatctt ttattgcact tgttttgacc attaagctat 180
atgtttagaa atggtcattt tacggaaaaa ttagaaaaat tctgataata gtgcagaata 240
aatgaattaa tgttttactt aatttatatt gaactgtcaa tgacaaataa aaattctttt 300
tgattatttt ttgttttcat ttaccagaat aaaaactaag aattaaaagt ttgattacag 360
tc
                                                                   362
<210> 443
<211> 624
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(624)
\langle 223 \rangle n = A,T,C or G
ttttttttt gcaacacaat atacatcaca gtgaaatgtg taatccttgc aaattgcaag 60
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ttgaaagaat taaattcaga ggagggaga gaaagagtac tcagtaggga ctgagcacta 120
aatgettatt ttaaaagaaa tgtaaagage agaaageaat teaggetace etgeettttg 180
tgctggctag tactccggtc ggtgtcagca gcacgtggca ttgaacattg caatgtggag 240
cccaaaccac agaaaatggg gtgaaattgg ccaactttct attaacttgg cttcctgttt 300
tataaaatat tgtgaataat atcacctact tcaaagggca gttatgaggc ttaaatgaac 360
taacgcctac aaaacactta aacatagata acataggtgc aagtactatg tatctggtac 420
atggtaaaca teettattat taaagteaac getaaaatga atgtgtgtge atatgetaat 480
agtacagaga gagggcactt aaaccaacta agggcctgga gggaaggttt cctggaaaga 540
ngatgettgt getgggteca aatettggte tactatgace ttggccaaat tatttaaact 600
ttgtccctat ctgctaaaca gatc
<210> 444
<211> 425
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(425)
<223> n = A,T,C or G
<400> 444
gcacatcatt nntcttgcat tctttgagaa taagaagatc agtaaatagt tcagaagtgg 60
gaagetttgt ccaggeetgt gtgtgaacee aatgttttge ttagaaatag aacaagtaag 120
ttcattgcta tagcataaca caaaatttgc ataagtggtg gtcagcaaat ccttgaatgc 180
tgcttaatgt gagaggttgg taaaatcctt tgtgcaacac tctaactccc tgaatgtttt 240
getgtgetgg gacetgtgca tgecagacaa ggecaagetg getgaaagag caaccageca 300
cetetgeaat etgecacete etgetggeag gatttgtttt tgcateetgt gaagageeaa 360
ggaggcacca gggcataagt gagtagactt atggtcgacg cggccgcgaa tttagtagta 420
 gtaga
 <210> 445
 <211> 414
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) ... (414)
 <223> n = A,T,C \text{ or } G
 <400> 445
 catgittatg nittiggatt actitigggea cctagigtit ctaaatcgic tatcatictt 60
 ttctgttttt caaaagcaga gatggccaga gtctcaacaa actgtatctt caagtctttg 120
 tgaaattett tgeatgtgge agattattgg atgtagttte etttaactag catataaate 180
 tggtgtgttt cagataaatg aacagcaaaa tgtggtggaa ttaccatttg gaacattgtg 240
 aatgaaaaat tgtgtctcta gattatgtaa caaataacta tttcctaacc attgatcttt 300
 ggatttttat aatcetacte acaaatgact aggettetee tettgtattt tgaagcagtg 360
 tgggtgctgg attgataaaa aaaaaaaaag tcgacgcggc cgcgaattta gtag
 <210> 446
 <211> 631
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(631)
```

<223> n = A, T, C or G

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<400> 446
 acaaattaga anaaagtgcc agagaacacc acataccttg tccggaacat tacaatggct 60
 tetgeatgea tgggaagtgt gageatteta teaatatgea ggageeatet tgeaggtgtg 120
 atgctggtta tactggacaa cactgtgaaa aaaaggacta cagtgttcta tacgttgttc 180
 coggtectgt acgatttcag tatgtettaa togcagetgt gattggaaca attcagattg 240
 ctgtcatctg tgtggtggtc ctctgcatca caagggccaa actttaggta atagcattgg 300
 actgagattt gtaaactttc caaccttcca ggaaatgccc cagaagcaac agaattcaca 360
 gacagaagca aaatacaggg cactacagtt cagacaatac aacaagagcg tecacgaggt 420
 taatctaaag ggagcatgtt tcacagtggc tggactaccg agagcttgga ctacacaata 480
 cagtattata gacaaaagaa taagacaaga gatctacaca tgttgccttg catttgtggt 540
 aatctacacc aatgaaaaca tgtactacag ctatatttga ttatgtatgg atatatttga 600
 aatagtatac attgtcttga tgttttttct g
 <210> 447
 <211> 585
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) ... (585)
 \langle 223 \rangle n = A,T,C or G
 <400> 447
 ccttgggaaa antntcacaa tataaagggt cgtagacttt actccaaatt ccaaaaaggt 60
cctggccatg taatcctgaa agttttccca aggtagctat aaaatcctta taagggtgca 120
gcctcttctg gaattcctct gatttcaaag tctcactctc aagttcttga aaacgagggc 180
agtteetgaa aggeaggtat ageaactgat etteagaaag aggaactgtg tgeaceggga 240
tgggctgcca gagtaggata ggattccaga tgctgacacc ttctggggga aacagggctg 300
ccaggtttgt catagcactc atcaaagtcc ggtcaacgtc tgtgcttcga atataaacct 360
gttcatgttt ataggactca ttcaagaatt ttctatatct ctttcttata tactctccaa 420
gttcataatg ctgctccatg cccagctggg tgagttggcc aaatccttgt ggccatgagg 480
attectttat ggggteagtg ggaaaggtgt caatgggaet teggteteea tgeegaaaca 540
ccaaagtcac aaacttcaac teettggeta gtacaetteg gteta
<210> 448
<211> 93
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) ... (93)
<223> n = A, T, C or G.
<400> 448
tgctcgtggg tcattctgan nnccgaactg accntgccag ccctgccgan gggccnccat 60
ggeteectag tgeeetggag aggangggge tag
<210> 449
<211> 706
<212> DNA
<213> Homo sapiens
<220>
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<221> misc_feature

<222> (1) ... (706)

<213> Homo sapiens

```
<223> n = A,T,C \text{ or } G
<400>. 449
ccaagttcat gctntgtgct ggacgctgga cagggggcaa aagcnnttgc tcgtgggtca 60
ttetganeac cgaactgace atgccagece tgccgatggt cetecatgge tecetagtge 120
cctggagagg aggtgtctag tcagagagta gtcctggaag gtggcctctg ngaggagcca 180
cggggacage atcetgcaga tggtcgggcg cgtcccattc gccattcagg ctgcgcaact 240
gttgggaagg gcgatcggtg cgggcctctt cgctattacg ccagctggcg aaagggggat 300
grgctgcaag gcgattaagt tgggtaacgc cagggttttc ccagtcncga cgttgtaaaa 360
cgacggccag tgaattgaat ttaggtgacn ctatagaaga gctatgacgt cgcatgcacg 420
cgtacgtaag cttggatcct ctagagcggc cgcctactac tactaaattc gcggccgcgt 480
cgacgtggga tccncactga gagagtggag agtgacatgt gctggacnet gtccatgaag 540
cactgagcag aagetggagg cacaacgene cagacactca cagetactca ggaggetgag 600
aacaggttga acctgggagg tggaggttgc aatgagctga gatcaggccn ctgcncccca 660
<210> 450.
<211> 493
<212> DNA
<213> Homo sapiens
<400> 450
gagacggagt gtcactctgt tgcccaggct ggagtgcagc aagacactgt ctaagaaaaa 60
acagetetaa aaggeaaaac aacataaaaa gaaataecet atageggaaa taagagagec 120
aaatgagget gagaaettta caaagggate ttacagacat gtegecaata teactgeatg 180
agcctaagta taagaacaac ctttggggag aaaccatcat ttgacagtga ggtacaattc 240
caagtcaggt agtgaaatgg gtggaattaa actcaaatta atcctgccag ctgaaacgca 300
agagacactg tcagagagtt aaaaagtgag ttctatccat gaggtgattc cacagtcttc 360
tcaagtcaac acatetgtga actcacagac caagttetta aaccactgtt caaactetge 420
tacacatcag aatcacctgg agagetttac aaacteccat tgccgagggt cgacgeggec 480
gcgaatttag tag
 <210> 451
 <211> 501
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(501)
 <223> n = A, T, C or G
 <400> 451
 gggegegtee cattegecat teaggetgeg caactgttgg gaagggegat eggtgeggge 60
 ctcttcgcta ttacgccagc tggcgaaagg gggatgtgct gcaaggcgat taagttgggt 120
 aacgccaggg ttttcccagt cncgacgttg taaaacgacg gccagtgaat tgaatttagg 180
 tgacnetata gaagagetat gacgtegeat geacgegtae gtaagettgg atcetetaga 240
 geggeegeet actactacta aattegegge egegtegaeg tgggateene actgagagag 300
 tggagagtga catgtgctgg acnotgtcca tgaagcactg agcagaagct ggaggcacaa 360
 cgcnccagac actcacagct actcaggagg ctgagaacag gttgaacctg ggaggtggag 420
 gttgcaatga getgagatca ggccnetgen ecceageatg gatgacagag tgaaacteca 480
                                                                  501
 tottaaaaaa aaaaaaaaaa a
 <210> 452
 <211> 51
 <212> DNA
```

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<220>
 <221> misc_feature
 <222> (1)...(51)
 \langle 223 \rangle n = A,T,C or G
 <400> 452
 agacggtttc accnttacaa cnccttttag gatgggnntt ggggagcaag c
                                                                     51
 <210> 453
 <211> 317
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc feature
 <222> (1) . . . (317)
 \langle 223 \rangle n = A,T,C or G
 <400> 453
 tacatettge tttttcccca ttggaactag tcattaaccc atctctgaac tggtagaaaa 60
 acatetgaag agetagteta teageatetg geaagtgaat tggatggtte teagaaceat 120
 ttcacccana cagcctgttt ctatcctgtt taataaatta gtttgggttc tctacatgca 180
 taacaaaccc tgctccaatc tgtcacataa aagtctgtga cttgaagttt antcagcacc 240
 cccaccaaac tttatttttc tatgtgtttt ttgcaacata tgagtgtttt gaaaataagg 300
tacccatgtc tttatta
 <210> 454
 <211> 231
<212> DNA
<213> Homo sapiens
ttcgaggtac aatcaactct cagagtgtag tttccttcta tagatgagtc agcattaata 60
taagccacgc cacgctettg aaggagtett gaatteteet etgeteacte agtagaacca 120
agaagaccaa attettetge ateccagett geaaacaaaa ttgttettet aggtetecae 180
cetteetttt teagtgitee aaageteete acaatticat gaacaacage t
<210> 455
<211> 231
<212> DNA
<213> Homo sapiens
<400> 455
taccaaagag ggcataataa tcagtctcac agtagggttc accatcctcc aagtgaaaaa 60
cattgttccg aatgggcttt ccacaggcta cacacacaaa acaggaaaca tgccaagttt 120
gtttcaacgc attgatgact tetecaagga tetteetttg gcategacca cattcagggg 180
caaagaattt ctcatagcac agctcacaat acagggctcc tttctcctct a
<210> 456
<211> 231
<212> DNA
<213> Homo sapiens
<400> 456
ttggcaggta cccttacaaa gaagacacca taccttatgc gttattaggt ggaataatca 60
ttccattcag tattatcgtt attattcttg gagaaaccct gtctgtttac tgtaaccttt 120
tgcactcaaa ttcctttatc aggaataact acatagccac tatttacaaa gccattggaa 180
```

```
cotttttatt tggtgcaget gctagtcagt coctgactga cattgccaag t
                                                                   231
<210> 457
<211> 231
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1) ... (231)
<223> n = A, T, C or G
<400> 457
cgaggtaccc aggggtctga aaatctctnn tttantagtc gatagcaaaa ttgttcatca 60
gcatteetta atatgatett getataatta gatttttete cattagagtt catacagttt 120
tatttgattt tattagcaat ctctttcaga agacccttga gatcattaag ctttgtatcc 180
agttgtctaa atcgatgcct catttcctct gaggtgtcgc tggcttttgt g
<210> 458
<211> 231
<212> DNA
<213> Homo sapiens
<400> 458
aggictggit cocccactt coactcoct ctactctctc taggactggg ctgggccaag 60
agaagagggg tggttaggga agccgttgag acctgaagcc ccaccctcta ccttccttca 120
acaccctaac cttgggtaac agcatttgga attatcattt gggatgagta gaatttccaa 180
ggtcctgggt taggcatttt ggggggccag accccaggag aagaagattc t
<210> 459
<211> 231
<212> DNA
 <213> Homo sapiens
 <400> 459
ggtaccgagg ctcgctgaca cagagaaacc ccaacgcgag gaaaggaatg gccagccaca 60
cettegegaa acetgtggtg geccaccagt cetaaeggga caggacagag agacagagca 120
geeetgeact gtttteecte caccacagee atcetgteee teattggete tgtgetttee 180
 actatacaca gtcaccgtcc caatgagaaa caagaaggag caccctccac a
 <210> 460
 <211> 231
 <212> DNA
 <213> Homo sapiens
 gcaggtataa catgctgcaa caacagatgt gactaggaac ggccggtgac atggggaggg 60
 cetateacce tattettggg ggetgettet teacagtgat catgaageet ageageaaat 120
 cecacetece cacaegeaca eggecageet ggageceaca gaagggteet cetgeageea 180
 gtggagettg gtecageete cagtecacee etaccagget taaggataga a
 <210> 461
 <211> 231
 <212> DNA
 <213> Homo sapiens
 cgaggtttga gaagctctaa tgtgcagggg agccgagaag caggcggcct agggagggtc 60
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gcgtgtgctc cagaagagtg tgtgcatgcc agaggggaaa caggcgcctg tgtgtcctgg 120
 gtggggttca gtgaggagtg ggaaattggt tcagcagaac caagccgttg ggtgaataag 180
 agggggattc catggcactg atagagccct atagtttcag agctgggaat t
 <210> 462
 <211> 231
 <212> DNA
 <213> Homo sapiens
 <400> 462
 aggtaccete attgtageea tgggaaaatt gatgtteagt ggggateagt gaattaaatg 60
 gggtcatgca agtataaaaa ttaaaaaaaa aagacttcat gcccaatctc atatqatqtq 120
 gaagaactgt tagagagacc aacagggtag tgggttagag atttccagag tcttacattt 180
 tctagaggag gtatttaatt tcttctcact catccagtgt tgtatttagg a
 <210> 463
 <211> 231
 <212> DNA
 <213> Homo sapiens
<400> 463
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catttgacag gtgtcttttc ctctggacct cggtgtcccc atctgagtga gaaaaggcag 180
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<210> 464
<211> 231
<212> DNA
<213> Homo sapiens
<400> 464
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aaggacatca catatgaaga atgtttaagt tggaggtggc aacgtgaatt gcaaacaggg 120
cctgcttcag tgactgtgtg cctgtagtcc cagctactcg ggagtctgtg tgaggccagg 180
ggtgccagcg caccagctag atgctctgta acttctaggc cccattttcc c
<210> 465
<211> 231
<212> DNA
<213> Homo sapiens
<400> 465
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gtggcaaatt agcaacaaat totgacatca tatttatggt ttotgtatot ttgttgatga 120
aggatggcac aattitiget tgigticata atatactcag attagitcag ciccatcaga 180
taaactggag acatgcagga cattagggta gtgttgtagc tctggtaatg a
                                                                231
<210> 466
<211> 231
<212> DNA
<213> Homo sapiens
<400> 466
caggtacete tttccattgg atactgtgct agcaagcatg eteteegggg tttttttaat 60.
ggcettegaa cagaacttge cacataceca ggtataatag tttetaacat ttgeecagga 120
cctgtgcaat caaatattgt ggagaattcc ctagctggag aagtcacaaa gactataggc 180
aataatggag accagtccca caagatgaca accagtcgtt gtgtgcggct g
```

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<210> 467
<211> 311
<212> DNA
<213> Homo sapiens
<400> 467
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tggtggcttt teteettttt catcaagact ceteageagg gageceagae cageetgeae 120
tgtgccttaa cagaaggtct tgagattcta agtgggaatc atttcagtga ctgtcatgtg 180
gcatgggtct ctgcccaagc tcgtaatgag actatagcaa ggcggctgtg ggacgtcagt 240
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ctgcagcaga c
<210> 468
<211> 3112
<212> DNA
<213> Homo sapiens
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aagatetgea tggtgggaag gaeetgatga tacagagttt-gataggagae, aattaaagge 120
tggaaggcac tggatgcctg atgatgaagt ggactttcaa actggggcac tactgaaacg 180
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tecaaageea aegtegaatt ttgaaacata teaaagetet tetteaagae aaataateta 1140
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aaagtgagca ttaccaatga gaggaaaaca gacgagaaaa tettgatgge ttcacaagac 1740
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accacggggc agagggtcag gattctggcc ctgctgccta aactgtgcgt tcataaccaa 1860
atcatttcat atttctaacc ctcaaaacaa agctgttgta atatctgatc tctacggttc 1920
cttctgggcc caacattctc catatatcca gccacactca tttttaatat ttagttccca 1980
gatetgtact gtgacettte tacactgtag aataacatta etcattttgt teaaagacee 2040
ttegtgttge tgeetaatat gtagetgaet gttttteeta aggagtgtte tggeecaggg 2100
gatetgtgaa eaggetggga ageateteaa gatettteea gggttataet taetageaea 2160
cagcatgate attacggagt gaattateta atcaacatca tectcagtgt etttgeccat 2220
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<210> 469 <211> 2229 <212> DNA

<213> Homo sapiens

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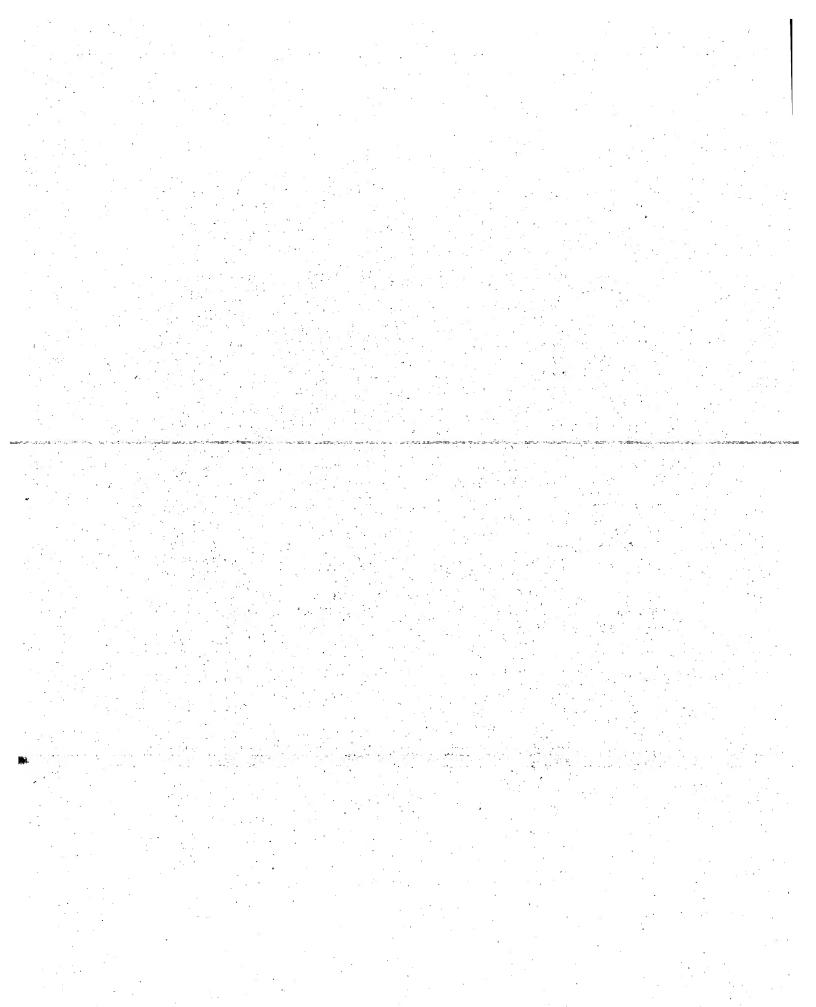
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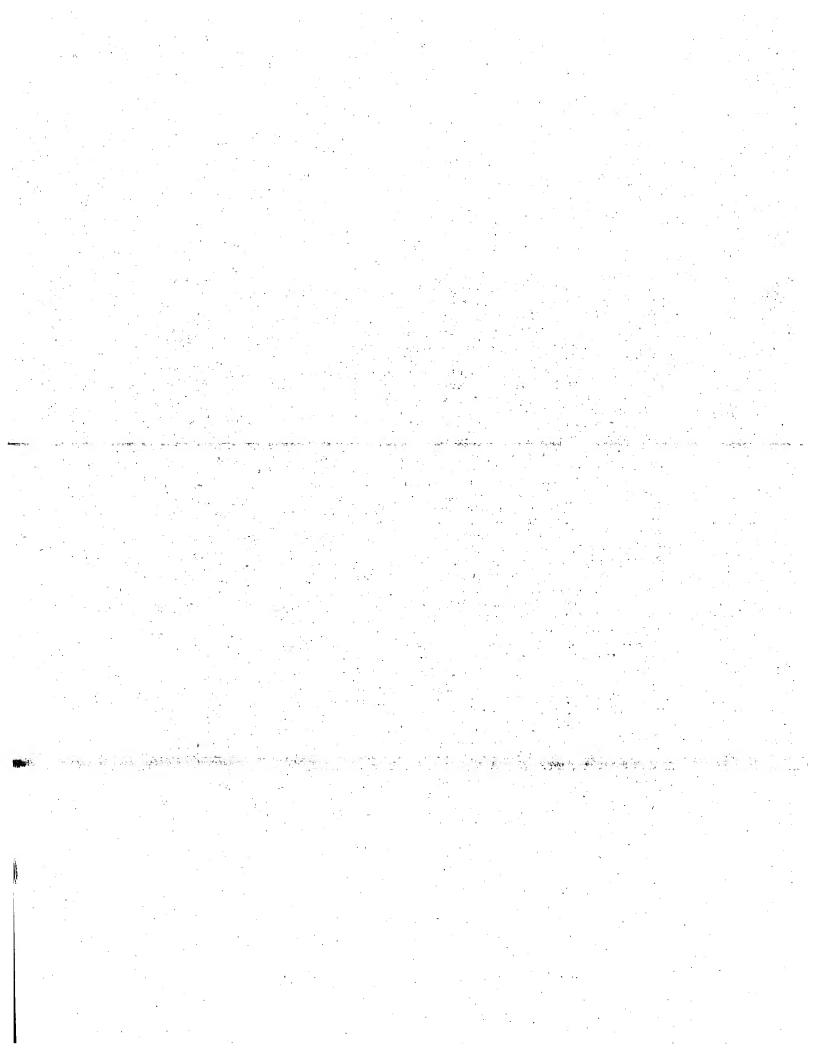
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His Thr His Cys His Thr Val Thr Trp Thr His Leu His Thr Ile Thr 65 70 75 80

Pro Pro His Thr Leu Pro Val Asp Thr Arg Thr His Arg His Cys His 85 90 95

Thr Asp Thr Gln Asn Thr Val Thr Arg Arg His His His Ala Asp Thr 100 105 110

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Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Asn Thr
65 70 75

Pro Thr His Cys His Met Asp Thr Gly Thr His Thr Ala Thr Leu Ser®

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His Gly His Thr Ser Thr Pro Ser His His His Thr His Cys Leu Trp 100 105 110

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His Gly Asp Ile Thr Thr Trp Thr His Cys His Thr Thr Gly Thr 50 55 60

Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Asn Thr 65 70 75 80

Pro Thr His Cys His Met Asp Thr Ala Thr His Thr Ala Thr Leu Ser 85 90 95

His Gly His Thr Ser Ile Pro Ser His His His Thr His Cys His Val

Asp Thr Arg Thr His Arg His Cys His Thr Asp Thr Gln Asn Thr Val

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Cys His Thr Asp Thr Thr Ser Leu Pro His Phe His Val Ser Ala 165 170 175

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Leu Ser Gly Cys His Leu Met Ala Asp Gly Ala Lys Ala Leu Gly Lys
50 55 60

Ala Asp Gly Pro Trp Pro Tyr Leu Phe Val Arg Arg Thr Asp Val Pro

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Gln	His	Ala 11	a Glr	n Ala	. Ser	Va]	Leu 120	Leu	Leu	Cys	Tyr	Lys 125		Ser	His
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<213> Homo sapiens
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Lys Leu Thr Arg Ser Ser Val Ser Val Ala Gly Ala Tyr Ala Cys Arg 90

Ala Gly Pro Gly Trp Leu Lys Glu Gln Pro Ala Thr Ser Ala Arg Val 100

Arg Leu Val Gln Ala Glu His Pro Pro Pro His Pro Leu Glu Glu Val . 120

Gly Met Ala Arg Phe Pro Gln Pro Glu Cys Leu Pro Pro Tyr Cys 135 130

<210> 484

<211> 30

<212> PRT

<213> Homo Sapien

<400> 484

Thr Ala Ala Ser Asp Asn Phe Gln Leu Ser Gln Gly Gln Gly Phe Ala Ile Pro Ile Gly Gln Ala Met Ala Ile Ala Gly Gln Ile 25

<210> 485

<211> 31

<212> DNA

<213> Artificial Sequence

<223> Made in a lab

<400> 485

gggaagetta teacetatgt geegeetetg e

<210> 486

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

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<223> Made in a lab
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                                                                         27
       <210> 487
       <211> 36
       <212> DNA
       <213> Artificial Sequence
      <220>
      <223> Made in a lab
       <400> 487
cccgaattct tagctgccca tccgaacgcc ttcatc
                                                                         36
      <210> 488
      <211> 33
      <212> DNA
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
     '<400> 488'
gggaagcttc ttccccggct gcaccagctg tgc
      <210> 489
      <211> 19
      <212> PRT
      <213> Artificial Sequence
      <223> Made in a lab
      <400> 489
Met Asp Arg Leu Val Gln Arg Phe Gly Thr Arg Ala Val Tyr Leu Ala
1
Ser Val Ala
      <210> 490
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 490
Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala Thr Cys
Leu Ser His Ser
      <210> 491
     <211> 20 ....
      <212> PRT
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<213> Artificial Sequence
                   <223> Made in a lab
Thr Cys Leu Ser His Ser Val Ala Val Val Thr Ala Ser Ala Ala Leu
                   <400> 491
                                                                                                                10
Thr Gly Phe Thr
                            20
                    <210> 492
                     <211> 20
                     <212> PRT
                     <213> Artificial Sequence
                     <220>
                    <223> Made in a lab
               <400> 492
  Ala Leu Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr
   1 Section 1 Sect
  Leu Ala Ser Leu
                    20
               - <210> 493
                      <211> 20
                      <212> PRT
                <213> Artificial Sequence
                       <220>
                       <223> Made in a lab
   Tyr Thr Leu Ala Ser Leu Tyr His Arg Glu Lys Gln Val Phe Leu Pro
                       <400> 493
                                                                                                                             10
   Lys Tyr Arg Gly
                                 20
                        <210> 494
                        <211> 20
                        <212> PRT
                         <213> Artificial Sequence
                         <220>
                         <223> Made in a lab
                        <400> 494
    Leu Pro Lys Tyr Arg Gly Asp Thr Gly Gly Ala Ser Ser Glu Asp Ser
                                                                                       10
       1
     Leu Met Ile Ser
                                             20
      <211> 20
<212> PRT
<213> Artificial Sequence
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<220>
       <223> Made in a lab
       <400> 495
 Asp Ser Leu Met Thr Ser Phe Leu Pro Gly Pro Lys Pro Gly Ala Pro
 1
                                    10
 Phe Pro Asn Gly
            20
       <210> 496
       <211> 21
       <212> PRT
       <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 496
Ala Pro Phe Pro Asn Gly His Val Gly Ala Gly Gly Ser Gly Leu Leu
                                     10
Pro Pro Pro Pro Ala
           20
      <210> 497
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 497
Leu Leu Pro Pro Pro Pro Ala Leu Cys Gly Ala Ser Ala Cys Asp Val
Ser Val Arg Val
           20
      <210> 498
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 498
Asp Val Ser Val Arg Val Val Gly Glu Pro Thr Glu Ala Arg Val
Val Pro Gly Arg
      <210> 499
      <211> 20
      <212> PRT
      <213> Artificial Sequence
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<220>

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<223> Made in a lab
      <400> 499
Arg Val Val Pro Gly Arg Gly Ile Cys Leu Asp Leu Ala Ile Leu Asp
                                    10
Ser Ala Phe Leu
          20
      <210> 500
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 500
Leu Asp Ser Ala Phe Leu Leu Ser Gln Val Ala Pro Ser Leu Phe Met
                                    10
Gly Ser Ile Val
      <210> 501
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 501
Phe Met Gly Ser Ile Val Gln Leu Ser Gln Ser Val Thr Ala Tyr Met
 1
 Val Ser Ala Ala
            20
       <210> 502
       <211> 414
       <212> DNA
       <213> Homo Sapien
       <220>
       <221> misc_feature
       <222> (1) ... (414)
       <223> n = A,T,C or G.
       <400> 502
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                                                                        60
 teagteggtg gaggagteeg ggggtegeet ggteaegeet gggacacett tgacanteae
                                                                       120
 ctgtagagtt tttggaatng acctcagtag caatgcaatg agctgggtcc gccaggctcc
                                                                       180
 agggaagggg ctggaatgga tcggagccat tgataattgt ccacantacg cgacctgggc
 gaaaggccga ttnatnattt ccaaaacctn gaccacggtg gatttgaaaa tgaccagtcc
 gacaaccgag gacacggcca cctatttttg tggcagaatg aatactggta atagtggttg
 gaagaatatt tggggcccag gcaccctggt caccgtntcc tcagggcaac ctaa
```

<210> 503 <211> 379 <212> DNA

```
<213> Homo Sapiens
       <220>
       <221> misc_feature
       <222> (1)...(379)
       <223> n = A, T, C or G
       <400> 503
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                                                                         60
 ctggtcacgc ctgggacacc cctgacactc acctgcaccg tntctggatt ngacatcagt
                                                                        120
 agctatggag tgagctgggt ccgccaggct ccagggaagg ggctggnata catcggatca
                                                                        180
 ttagtagtag tggtacattt tacgcgagct gggcgaaagg ccgattcacc atttccaaaa
                                                                        240
 cctngaccac ggtggatttg aaaatcacca gtttgacaac cgaggacacg gccacctatt
                                                                        300
 tntgtgccag aggggggttt aattataaag acatttgggg cccaggcacc ctggtcaccq
                                                                        360
tntccttagg gcaacctaa
                                                                        379
       <210> 504
       <211> 19
       <212> PRT
       <213> Artificial Sequence
       <220>
       <223> Made in a lab
       <400> 504
Gly Phe Thr Asn Tyr Thr Asp Phe Glu Asp Ser Pro Tyr Phe Lys Glu
 1
Asn Ser Ala
      <210> 505
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 505
Lys Glu Asn Ser Ala Phe Pro Pro Phe Cys Cys Asn Asp Asn Val Thr
                                                         15
Asn Thr Ala Asn
            20
      <210> 506
      <211> 407
      <212> DNA
      <213> Homo Sapien
      <400> 506
atggagacag gcctgcgctg gcttctcctg gtcgctgcgc tcaaaggtgt ccagtgtcag
                                                                        60
tegetggagg agteeggggg tegeetggte aegeetggga caeccetgae aeteaeetge
                                                                       120
acceptctctg gattctccct cagtagcaat gcaatgatct gggtccgcca ggctccaggg
                                                                       180
aaggggctgg aatacatcgg atacattagt tatggtggta gcgcatacta cgcgagctgg
                                                                       240
gtgaaaggcc gattcaccat ctccaaaacc tcgaccacgg tggatctgag aatgaccagt
                                                                       300
ctgacaaccg aggacacggc cacctatttc tgtgccagaa atagtgattt tagtggtatg 360
ttgtggggcc caggcaccct ggtcaccgtc tcctcagggc aacctaa
```

```
<210> 507
        <211> 422
        <212> DNA
         <213> Homo Sapien
         <400> 507
  atggagacag gcctgcgctg gcttctcctg gtcgctgtgc tcaaaggtgt ccagtgtcag
  teggtggagg agteeggggg tegeetggte acgeetggga cacceetgae acteacetgt
                                                                         120
  acagtetetg gattetecet cagcaactac gacetgaact gggteegeca ggetecaggg
                                                                         180
  aaggggctgg aatggatcgg gatcattaat tatgttggta ggacggacta cgcgaactgg
                                                                         240
  gcaaaaggcc ggttcaccat ctccaaaacc tcgaccaccg tggatctcaa gatcgccagt
                                                                         300
  cegacaaceg aggacacege cacetattte tgtgccagag ggtggaagtg cgatgagtet
                                                                         360
  ggtccgtgct tgcgcatctg gggcccaggc accctggtca ccgtctcctt agggcaacct
                                                                          420
                                                                          422
         <210> 508
         <211> 411
         <212> DNA
         <213> Homo Sapiens
         <220>
         <221> misc_feature
         <222> (1) ... (411)
         <223> n = A,T,C or G
   atggagacag gcctcgctgg cttctcctgg tcgctgtgct caaaggtgtc cagtgtcagt
   cggtggagga gtccggggt cgcctggtca cgcctgggac acccctgaca ctcacctgca
   cagtetetgg aategacete agtagetact geatgagetg ggteegeeag geteeaggga
                                                                          180
   aggggctgga atggatcgga atcattggta ctcctggtga cacatactac gcgaggtggg
                                                                          240
   cgaaaggccg attcaccatc tccaaaacct cgaccacggt gcatntgaaa atcnccagtc
                                                                          300
   cgacaaccga ggacacggcc acctatttct gtgccagaga tcttcgggat ggtagtagta
                                                                          360
                                                                          4.11
   ctggttatta taaaatctgg ggcccaggca ccctggtcac cgtctccttg g
         <210> 509
         <211> 15
         <212> PRT
         <213> Artificial Sequence
         <220>
         <223> Made in a lab
  Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                                       10
         <210> 510
         <211> 15
         <212> PRT
         <213> Artificial Sequence
         <220>
         <223> Made in a lab
         <400> 510
Pro Glu Tyr Asn Arg Pro Leu Leu Ala Asn Asp Leu Met Leu Ile
                                       10
```

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<210> 511
      <211> 15
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 511
Tyr His Pro Ser Met Phe Cys Ala Gly Gly Gln Asp Gln Lys
                                   10
      <210> 512
      <211> 15
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 512
Asp Ser Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu
                                   10
      <210> 513
      <211> 15
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
    <400> 513
Ala Pro Cys Gly Gln Val Gly Val Pro Asx Val Tyr Thr Asn Leu
                                   10
      <210> 514
      <211> 15
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 514
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                                   10
     <210> 515
     <211> 15
     <212> PRT
     <213> Artificial Sequence
               <223> Made in a lab
```

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<400> 515
             Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg
                  5 10
                   <210> 516
                   <211> 15
                   <212> PRT
                   <213> Artificial Sequence
                   <220>
                   <223> Made in a lab
                   <400> 516
             Val Ser Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln
                                        10
                  5
                   <210> 517
                   <211> 15
                  <212> PRT
                   <213> Artificial Sequence
                   <223> Made in a lab
                  <400> 517
              Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met
                                       10
              1
                   <210> 518
                   <211> 15
                   <212> PRT
                   <213> Artificial Sequence
                    <223> Made in a lab
                   <400> 518
              Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg His Tyr Asp Glu Gly
                    <210> 519
                    <211> 17
                    <212> PRT
                    <213> Artificial Sequence
                    <223> Made in a lab
                    <400> 519
              Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg Asn Tyr Asp Glu Gly Cys
                                               10
              Gly
<210> 520
<211> 25
<212> PRT
                    <213> Artificial Sequence
```

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<220>
       <223> Made in a lab
      <400> 520
 Val Gly Glu Gly Leu Tyr Gln Gly Val Pro Arg Ala Glu Pro Gly Thr
 1
 Glu Ala Arg Arg His Tyr Asp Glu Gly
            20
      <210> 521
      <211> 21
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 521
Ala Pro Phe Pro Asn Gly His Val Gly Ala Gly Gly Ser Gly Leu Leu
 1
                                   10
Pro Pro Pro Pro Ala
            20
      <210> 522
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 522
Leu Leu Val Val Pro Ala Ile Lys Lys Asp Tyr Gly Ser Gln Glu Asp
                                   10
Phe Thr Gln Val
           20
      <210> 523
      <211> 254
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <220>
      <221> VARIANT
      <222> (1)...(254)
      <223> Xaa = any amino acid
      <400> 523
Met Ala Thr Ala Gly Asn Pro Trp Gly Trp Phe Leu Gly Tyr Leu Ile
                                       15
                                  . 10
Leu Gly Val Ala Gly Ser Leu Val Ser Gly Ser Cys Ser Gln Ile Ile
      20
                              . 25
Asn Gly Glu Asp Cys Ser Pro His Ser Gln Pro Trp Gln Ala Ala Leu
                           40
```

```
Val Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln
                        55
Trp Val Leu Ser Ala Thr His Cys Phe Gln Asn Ser Tyr Thr Ile Gly
Leu Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met
                                   90
               -85
Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
                                105
Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
                            120
Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala
                        135
Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg
                                       155
                    150
Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu Glu
                                    170
                165
Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
                                185
Ala Gly Gly Gln Kaa Gln Kaa Asp Ser Cys Asn Gly Asp Ser Gly
                            200
        195 '
               .
Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly
210 220
Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn Leu
                                       235
                    230
Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                245
<210> 524
<211> 765
<212> DNA
<213> Homo sapien
<400> 524
atggccacag caggaaatcc ctggggctgg ttcctggggt acctcatcct tggtgtcgca
                                                                     .60
                                                                     120
ggatcgctcg tctctggtag ctgcagccaa atcataaacg gcgaggactg cagcccgcac
                                                                     180
tegeageect ggeaggegge actggteatg gaaaacgaat tgttetgete gggegteetg
gtgcatccgc agtgggtgct gtcagccgca cactgtttcc agaactccta caccatcggg
                                                                     240
ctgggcctgc acagtcttga ggccgaccaa gagccaggga gccagatggt ggaggccagc
                                                                     300
ctctccgtac ggcacccaga gtacaacaga cccttgctcg ctaacgacct catgctcatc
                                                                     360
aagttggacg aatcegtgte egagtetgae accateegga geatcageat tgettegeag
                                                                     420
                                                                     480
tgecetaceg eggggaacte ttgeetegtt tetggetggg gtetgetgge gaaeggeaga
atgectaceg tgetgeagtg egtgaaegtg teggtggtgt etgaggaggt etgeagtaag
                                                                     540
                                                                     600
ctctatgacc cgctgtacca ccccagcatg ttctgcgccg gcggagggca agaccagaag
gactectgea acggtgacte tggggggece etgatetgea acgggtactt geagggeett
                                                                     660
gtgtctttcg gaaaagcccc gtgtggccaa gttggcgtgc caggtgtcta caccaacctc
                                                                     720
                                                                     765
tgcaaattca ctgagtggat agagaaaacc gtccaggcca gttaa
<210> 525
<211> 254
<212> PRT
<213> Homo sapien
<400> 525
Met Ala Thr Ala Gly Asn Pro Trp Gly Trp Phe Leu Gly Tyr Leu Ile
               - 5
                                   10
Leu Gly Val Ala Gly Ser Leu Val Ser Gly Ser Cys Ser Gln Ile Ile
```

20 25 30 Asn Gly Glu Asp Cys Ser Pro His Ser Gln Pro Trp Gln Ala Ala Leu

```
Val Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln
Trp Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly
65
                     70
Leu Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met
                 85
                                     90
Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
            100
                                 105
Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
                             120
                                                 125
Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala
                         135
                                             140
Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg
145
                    150
                                         155
                                                             160
Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu Glu
                                     170
Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
            180
Ala Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly
                            200
                                                 205
Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly
                        215
                                             220
Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn Leu
225
                    230
                                        235
Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                245
<210> 526
<211> 963
<212> DNA
<213> Homo sapiens
<400> 526
atgagtteet geaactteae acatgeeace tttgtgetta ttggtateee aggattagag 60
aaagcccatt totgggttgg ottocccoto otttocatgt atgtagtggo aatgtttgga 120
aactgcatcg tggtcttcat cgtaaggacg gaacgcagcc tgcacgctcc gatgtacctc 180
tttetetgea tgettgeage eattgaeetg geettateea catecaceat geetaagate 240
ettgeeettt tetggtttga tteeegagag attagetttg aggeetgtet taeeeagatg 300
ttetttatte atgecetete agecattgaa tecaceatee tgetggeeat ggeetttgae 360
cgttatgtgg ccatctgcca cccactgcgc catgctgcag tgctcaacaa tacagtaaca 420
gcccagattg gcatcgtggc tgtggtccgc ggatccctct ttttttccc actgcctctg 480
ctgatcaagc ggctggcctt ctgccactcc aatgtcctct cgcactccta ttgtgtccac 540
caggatgtaa tgaagttggc ctatgcagac actttgccca atgtggtata tggtcttact 600
gccattctgc tggtcatggg cgtggacgta atgttcatct ccttgtccta ttttctgata 660
atacgaacgg ttctgcaact gccttccaag tcagageggg ccaaggcctt tggaacctgt 720
gtgtcacaca ttggtgtggt actcgccttc tatgtgccac ttattggcct ctcagttgta 780
caccgctttg gaaacagcct tcatcccatt gtgcgtgttg tcatgggtga catctacctg 840
ctgctgcctc ctgtcatcaa tcccatcatc tatggtgcca aaaccaaaca gatcagaaca 900
cgggtgctgg ctatgttcaa gatcagctgt gacaaggact tgcaggctgt gggaggcaag 960
tga
<210> 527
<211> 320
<212> PRT
<213> Homo sapiens
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Met Ser Ser Cys Asn Phe Thr His Ala Thr Phe Val Leu Ile Gly Ile Pro Gly Leu Glu Lys Ala His Phe Trp Val Gly Phe Pro Leu Leu Ser Met Tyr Val Val Ala Met Phe Gly Asn Cys Ile Val Val Phe Ile Val Arg Thr Glu Arg Ser Leu His Ala Pro Met Tyr Leu Phe Leu Cys Met 55 Leu Ala Ala Ile Asp Leu Ala Leu Ser Thr Ser Thr Met Pro Lys Ile Leu Ala Leu Phe Trp Phe Asp Ser Arg Glu Ile Ser Phe Glu Ala Cys Leu Thr Gln Met Phe Phe Ile His Ala Leu Ser Ala Ile Glu Ser Thr 105 100 lle Leu Leu Ala Met Ala Phe Asp Arg Tyr Val Ala-Ile Cys-His-Pro 125 120 Leu Arg His Ala Ala Val Leu Asn Asn Thr Val Thr Ala Gln Ile Gly 135 Ile Val Ala Val Val Arg Gly Ser Leu Phe Phe Pro Leu Pro Leu 150 Leu Ile Lys Arg Leu Ala Phe Cys His Ser Asn Val Leu Ser His Ser 170 Tyr Cys Val His Gln Asp Val Met Lys Leu Ala Tyr Ala Asp Thr Leu Pro Asn Val Val Tyr Gly Leu Thr Ala Ile Leu Leu Val Met Gly Val 200 Asp Val Met Phe Ile Ser Leu Ser Tyr Phe Leu Ile Ile Arg Thr Val 210 Leu Gln Leu Pro Ser Lys Ser Glu Arg Ala Lys Ala Phe Gly Thr Cys 235 230 Val Ser His Ile Gly Val Val Leu Ala Phe Tyr Val Pro Leu Ile Gly 250 Leu Ser Val Val His Arg Phe Gly Asn Ser Leu His Pro Ile Val Arg 265 Val Val Met Gly Asp Ile Tyr Leu Leu Leu Pro Pro Val Ile Asn Pro 280 Ile Ile Tyr Gly Ala Lys Thr Lys Gln Ile Arg Thr Arg Val Leu Ala 290 295

Met Phe Lys Ile Ser Cys Asp Lys Asp Leu Gln Ala Val Gly Gly Lys

```
305
                    310
                                         315
                                                             320
       <210> 528
       <211> 20
       <212> DNA
       <213> Homo Sapien
       <400> 528
 actatggtcc agaggctgtg
                                                                         20
       <210> 529
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       <213> Homo Sapien
       <400> 529
 atcacctatg tgccgcctct
                                                                         20
<210> 530
<211> 1852
<212> DNA
<213> Homo sapiens
<400> 530
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aaaaccacct atgacaagcc cacagccaac ataatactaa atggggaaaa gttagaagca 120
tttcctctga gaactgcaac aataaataca aggatgctgg attttgtcaa atgccttttc 180
tgtgtctgtt gagatgctta tgtgactttg cttttaattc tgtttatgtg attatcacat 240
ttattgactt gcctgtgtta gaccggaaga gctggggtgt ttctcaggag ccaccgtgtg 300
ctgcggcagc ttcgggataa cttgaggctg catcactggg gaagaaacac aytcctgtcc 360
gtggcgctga tggctgagga cagagcttca gtgtggcttc tctgcgactg gcttcttcgg 420
ggagttette etteatagtt catecatatg getecagagg aaaattatat tattttgtta 480
tggatgaaga gtattacgtt gtgcagatat actgcagtgt cttcatctct tgatgtgtga 540
ttgggtaggt tccaccatgt tgccgcagat gacatgattt cagtacctgt gtctggctga 600 %
aaagtgtttg tttgtgaatg gatattgtgg tttctggatc tcatcctctg tgqqtqqaca 660
gettteteca eettgetgga agtgaeetge tgtecagaag tttgatgget gaggagtata 720
ccatcgtgca tgcatctttc atttcctgca tttcttcctc cctggatgga cagggggagc 780
ggcaagagca acgtgggcac ttctggagac cacaacgact cctctgtgaa gacgcttggg 840
agcaagaggt gcaagtggtg ctgccactgc ttcccctgct gcagggggag cggcaagagc 900
aacgtggtcg cttggggaga ctacgatgac agcgccttca tggatcccag gtaccacgtc 960
catggagaag atctggacaa gctccacaga gctgcctggt ggggtaaagt ccccagaaag 1020
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 Pro Glu Asp Arg Ser Gln His Leu Gly Glu Glu Leu Gln Gly Phe Trp
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Asp Lys Glu Val Leu Arg Ala Glu Asn Asp Ala Gln Lys Pro Ser Leu

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Gln	Leu	Pro	Ser	Asp 405	Gly	Lys	Lys	Met	Val 410	His	Val	Gln	Asp	Phe 415	Thr	
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Leu	Lys	Lys 515		Leu	Gln	Leu	Leu 520	Glu	Asp	Gly	Asp	Leu 525	Thr	Val	Ile	
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- Tyr Trp Ala Asn Lys Gln Ser Met Leu Asn Val Thr Val Asn Gly Gly
  740 745 750
- Gly Asn Val Thr Glu Lys Leu Asp Leu Asn Trp Tyr Leu Gly Ile Tyr
  755 \ 760 765
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- Leu Val Phe Tyr Val Leu Val Asn Ser Ser Gln Thr Leu His Asn Lys
  785 790 795 800
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20 25 30

Gln Lys Pro Ser Leu Thr Arg Ala Ile Ile Lys Cys Tyr Trp Lys Ser

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lu	Asn-	Met-	Met	Ile.	Ser	Val	Glu	Arg	Val	Ile	Glu	Tvr	Thr	Asp	T.eu

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- Pro His Glu Gly Val Ile Ile Phe Asp Asn Val Asn Phe Met Tyr Ser 1000
- Pro Gly Gly Pro Leu Val Leu Lys His Leu Thr Ala Leu Ile Lys Ser 1015 1020
- Gln Glu Lys Val Gly Ile Val Gly Arg Thr Gly Ala Gly Lys Ser Ser 1035 1030
- Leu Ile Ser Ala Leu Phe Arg Leu Ser Glu Pro Glu Gly Lys Ile Trp 1045 1050
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- Lys Met Ser Ile Ile Pro Gln Glu Pro Val Leu Phe Thr Gly Thr Met 1085 1075 1080
- Arg Lys Asn Leu Asp Pro Phe Asn Glu His Thr Asp Glu Glu Leu Trp 1100 1095

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- Asn Ala Leu Gln Glu Val Gln Leu Lys Glu Thr Ile Glu Asp Leu Pro 1115 1120 1110 1105
- Gly Lys Met Asp Thr Glu Leu Ala Glu Ser Gly Ser Asn Phe Ser Val 1125 1130 1135
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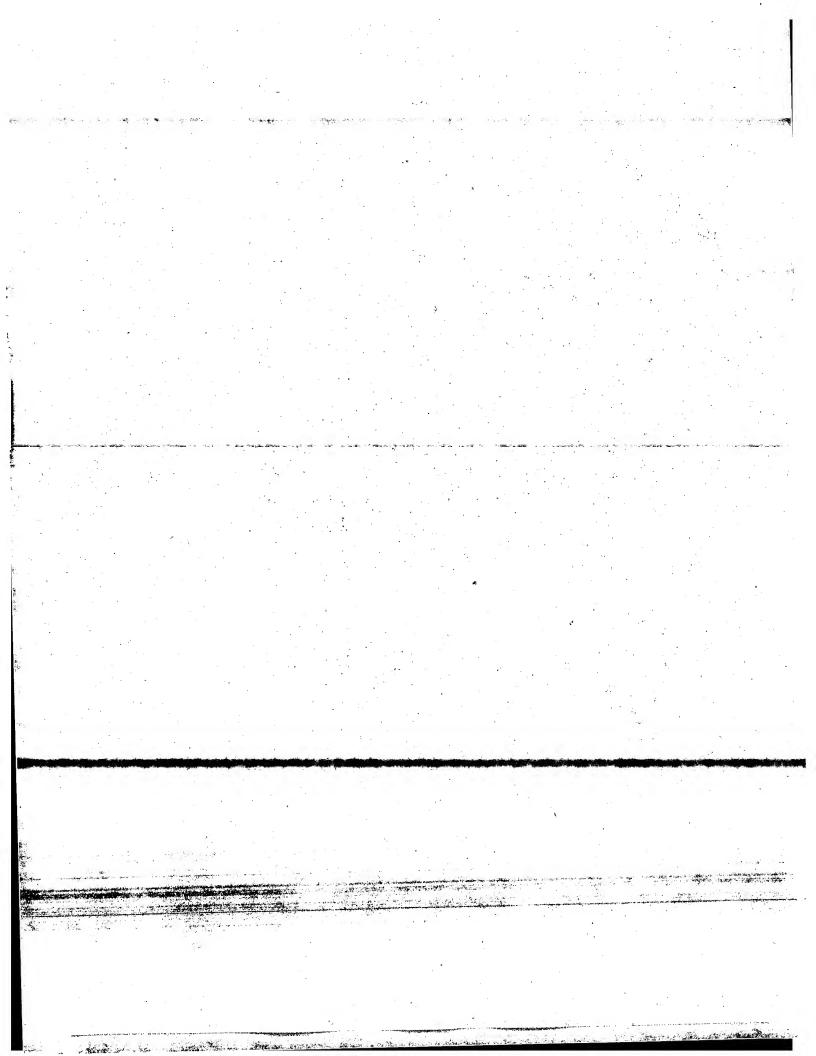
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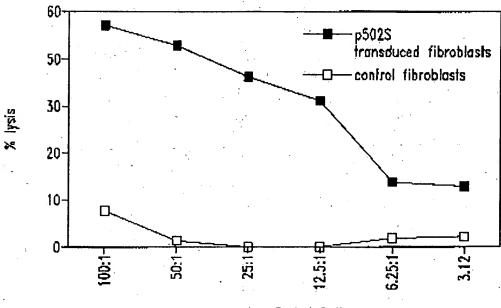
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Effector: Target Rotio

Fig. 1

W.

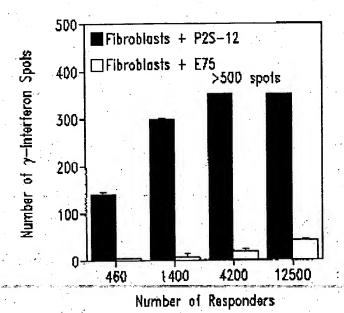


Fig. 2A

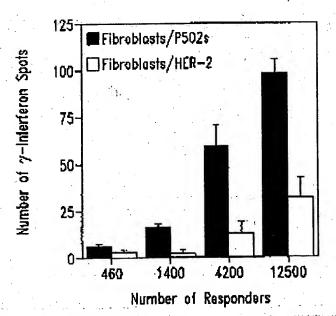
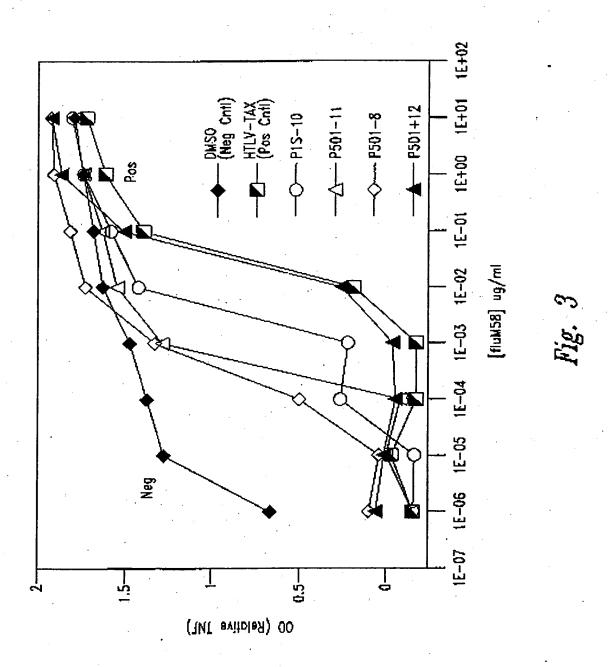
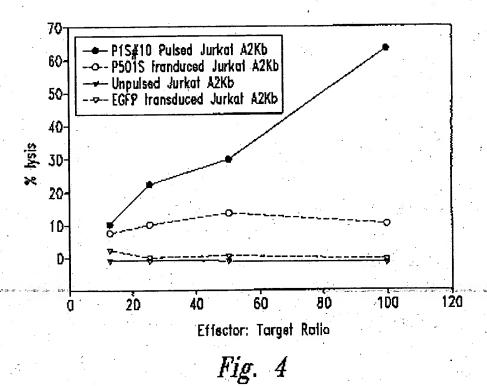
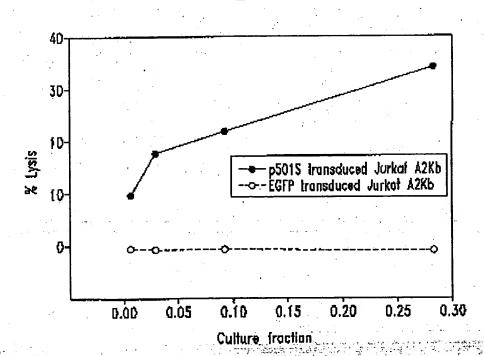
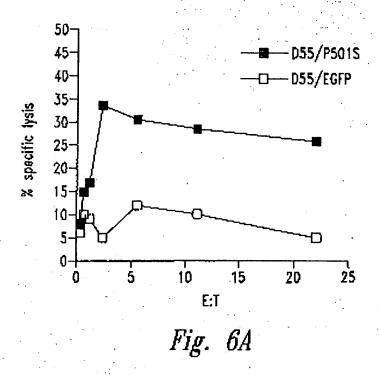


Fig. 2B









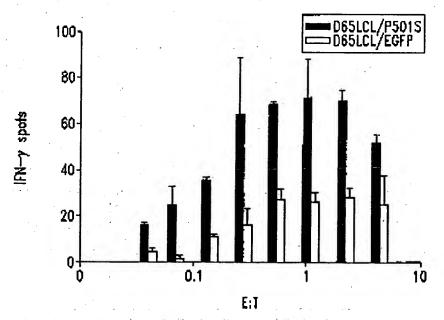
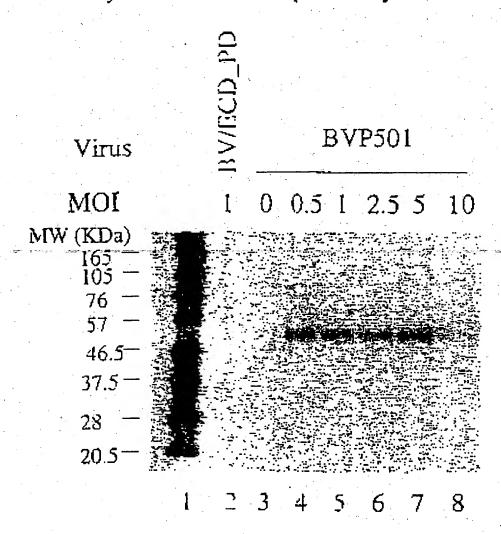


Fig. 6B

Expression of P501S by the Baculovirus Expression System



0.6 million high 5 relie in 5-well place were infected with an unrelated control virus BV/ECD_PD claim 1 without virus (lane 3), or with recombinant baculovirus for P501 at different VIDIs claim 4 - 8). Cell lyantes were run on SDS-PAGE under the reducing conditions and analyzed by Western blot with a monoclonal analyzed against P1 15 F501S-10E3-G4D3). Lane 1 is the biodinylated protein molecular weight marker. Sociales).

Fig. 7

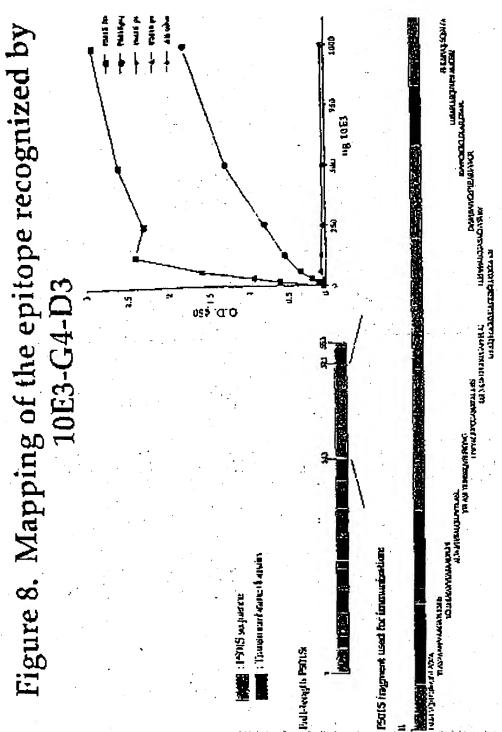


Fig. 8

Schematic of P501S with predicted transmembrane, cytoplasmic, and extracellular regions

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FALLSDLFROPDHCRO AYSVYAFMISLGGCLGYI, LPAI DWDTSALAPYLGTQEE

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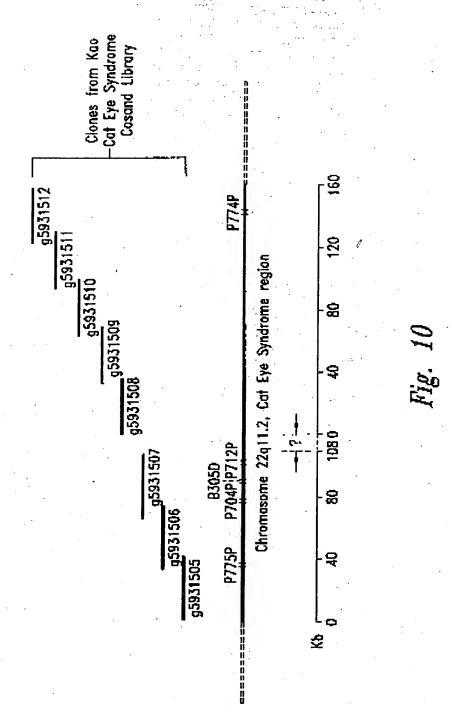
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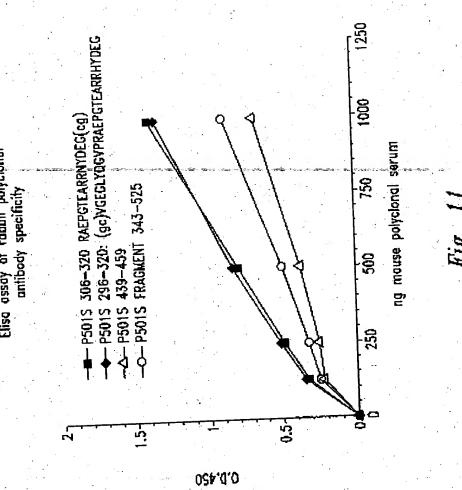
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Underlined sequence: Predicted transmembrane domain; Bold sequence: Predicted extracellular domain; Italic sequence: Predicted intracellular domain. Sequence in bold/underlined: used generate polyclonal rabbit serum

Localization of domains predicted using HMMTOP (G.E. Tushady an I. Simon (1998) Principles Governing Amino Acid Composition of Integral Membrane Proteins: Applications to topology Prediction J.Mol Biol. 283, 489-506.

Fig. 9





Elisa assay of rabbit polyclonal antibody specificity

780

814

•

1

## SEQUENCE LISTING

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                                                                                                                                     420
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                                                                                                                                     480
tglecager agreagert teartgreta tatggtgtet geograppe tqqqtetqqt
                                                                                                                                     540
cccatttact ttgctacaca ggtantattt gacaagaacg anttggccaa atactcageg
                                                                                                                                     600
ttaaaaaatt ccagcaacat tgggggtgga aggcctgcct caetgggtcc aaeteccego
                                                                                                                                     660
teetgttaac eccatgggge tgeoggettg geogceaatt tetgttgetg ecaaantnat
                                                                                                                                     720
gtggetetet getgeeacet gttgetgget gaagtgenta engeneanet nggggggtng
                                                                                                                                     780
ggngttdcc
                                                                  ing office of the property of the second of 
                                                                                                                                     789
```

-- <210> 11---<211> 772

```
<212> DNA
        <213> Homo sapien
       <320>
        <221> misc_feature
       <222> (1)...(772)
       <223> n = A,T,C or G
       <400> 11
 recacertar ecasstatta gacaceasca esgassaget ageaatggat tecepterac
 tttgttaaat aaataagtta aatatttaaa tgcctgtgtc tctgtgatgg caacagaagg
                                                                         60
                                                                        120
 accaacagge cacateetga taaaaggtaa gaggggggg gateageaaa aagacagtge
                                                                        180
 tgtgggctga ggggacctgg ttcttgtgtg ttgcccctca ggactettcc cctacaaata
                                                                        240
 actiticatat gitcasatee catggaggag tgitteatee tagaaactee catgeaagag
 ctacattasa cgaagciges ggttmagggg cttmagatg ggsaaccagg tgsctgagtt
                                                                        300
 tattcagete ccaasasee ttetetaggt gtgteteaae taggaggeta getgttaace
                                                                        36D
                                                                        420
 ctgageetsg graateeace tgeagagtee cogeatteea gtgeatggaa ccettetgge
                                                                        48D
 ofcootytat aagtocagae tgaaacoeee ttggaaggne tocagteagg cageeetana
 aactgaggaa aaaagaaaag gacgccccan cocccagctg tgcanctacg cacctcaaca
                                                                        540
                                                                        600
gracagggtg gragrassas aaccarttta ctttggraca aacaaaact ngggggggra
                                                                        660
acccoggcac cccnangggg gttaacagga ancngggnaa entggaacce aattnaggca
                                                                       720
ggcccnccac-cccnaatntt gctgggaaat ttttcctccc ctaaattntt to
      <210× 12
       <211> 751
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(751)
      <223> n = A, T, C or G
      <400> 12
genecaatte cagetgecae accaeceaeg gtgaetgeat tagtteggat gtcatacaaa
agotgattga agoaaccete tactttttgg tegtgageet tttgettggt geaggtttea
                                                                       120
ttggetgtgt togtgacgtt gtcattgcaa cagaatgggg gaaaggcact gttetetttg
asgrangerg agreeteass atcogratag tragegase cacagoactt sagccottre
                                                                       1BD
atggtggtgt tocacacttg agtgaagtot tootgggaac cataatettt ettgatggea
                                                                       240
                                                                       300
ggeactacca geaacyteag ggaagtocte agecettotg stgtacacca aggesaccac
                                                                       360
agragelgen accteageas igaagsigan gaggangsig aagaagaacg tenegaggge
                                                                       420
acacttgete teagtettam caccatamea gecentgaaa accaamamea magaccaema
                                                                       480
encoggetge gatgaagaaa tnaceceneg ttgacaaact tgcatggcae tggganceae
                                                                       540
agtggcccna aaaatettea aaaaggatge ceeatenatt gaeeeeccaa atgeccaetg
ccaacagaga ctoccccara coconaacga tganccoatt gnacaagate tochtagtet
                                                                       600
tnatnaacht gaaceetgen tngtggetee tgtteaggne ennggeetga ettetnaann
                                                                       660
                                                                       720
aangaacten gaagneeeca enggananne g
                                                                       751
      <210> 13
      <211> 729
      <212> DNA
     <213> Homo sagien
     <220>
     <221> misc feature
     <222> (1) ... (729)
     <223>n=A,T,CorG
```

. 360

Control of the second of the second

```
<400> 13.
gagocaggog tecetetgee tgeecaetea gtggcaacae cogggagetg ttttgtcott
tgtggancet cageaginee etetiteaga acteanigee aaganeeeig aacaggagee
                                                                         120
accatgoagt gottoagott cattaagaco atgatgates tetteaattt geteatettt
                                                                         180
clglgiggig cagecolgit ggmagigggc atmigggigt castegatgg ggmatectit
                                                                         24D
ctgsagatot Legggocaet gtegtecagt geestgeagt ttgteaacgt gggetaette
                                                                         30D
cteategoag ceggegtigt ggiettaget ctaggittee tgggetgeta tggtgetaag
                                                                         360
actgagagea agtgtgeect egtgaegtte ttetteatee teeteeteat etteattget
                                                                         420
gaggitgemm tgetgiggte geettggigt memeenat ggetgageme tteetgaegt
                                                                         480
tgctggtaat gcctgccatc aanaaaagat tatgggttcc caggaanact tcactcaagt
                                                                         540
qttggaacac caccatgaaa gggctcaagt gctgtggctt cnnccaacta tacggatttt
                                                                         600
gragantead ctactteras garranagty cottteecc atttetytty crattgreat
                                                                         660
acytecceaa cacagecaat tyaaaacety cacecaacee aaanygytee ccaaccanaa
                                                                         720
attnaaggg
                                                                         729
      <210> 14
      <211> 816
      <212> DNA
      <213 > Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (816)...
      <223> n = A, T, C or G
      <400> 14
tgctcttcct caaagttgtt cttgttgcca taacaaccac cataggtaaa gcgggcgcag
                                                                          60
Egitegetga aggggttgta gtaccagege gggatgetet cettgeagag teetgtgtet
                                                                         120
ggraggtrea rgragtgerr tittgtrartg gggaaatgga tgrggtggag rtegtraaaag
ccactogigt attiticaca ggcagceteg teogacgegt eggggcagit gggggigtet
                                                                         240
teacacteca ggaaactgte natgeageag ceattgetge ageggaactg ggtgggetga
                                                                         300
cangigoday apcacacing absocycott tocatennan eggeectene geneatecc
                                                                         360
tganceccan anetgectet casangecce secttgeses eccegacagg ctagastgga
                                                                         420
atcttettee egaaaggtag tinttetigt igereaance aneceentaa acaaactett
                                                                         480
geanatetge teegnggggg tentantace anogtgggaa aagaaceeca ggengegaac
                                                                         540
caanctigtt tggatnegaa genataatet netnttelge tiggiggaea geaceanina
                                                                        600
ctgtnnanct tragnocutg greetenigg griguncitg ascetaaten counteaset
                                                                        660
gggacaaggt aantngcont cottinaatt coonanonin coccetggit tggggtttin
                                                                        720
enemeteeta ecceagaaan neogtgitee ecceeaacta ggggeenaaa eenntintte
                                                                        780
cacaacccin ecccacccae gggttengnt ggttng
                                                                        816
      <210> 15
      <211> 783
      <212> DNA
      <213> Homo papien
      <220>
      <221> misc_feature
      <222> (1) ... [783]
      <223> n = A, T, C \circ r \cdot G
      <400> 15
ccaaggcotg ggcaggcata nacttgaagg tacaacccca ggaacccctg gtgotgaagg
                                                                         60
atgiggazaa cacagatigg cgcctacige ggggigacae ggaigteagg giagagaaga
                                                                      120
aagacccaaa ccaggtggaa ctgtggggac tcaaggaang cacctacctg ttccagctga\cdot \cdot \cdot \cdot \cdot 180 \cdot \cdot \cdot
cagigacias cicagaccae ceagaggaca eggecaacgi cacagicaci gigetgicca
                                                                        240
ccaagcasac agaasactac tgcctcgcat ccaacaanat gggtcgctgc cggggctctt 300-
teccaegetg gtactatgae eccaeggage agatetgema gagtttegtt tatggagget
```

```
gettgggeaa caagaacaac tacetteggg aagaagagtg cattetance tgtengggtq
                                                                                                                                420
tgcaaggtgg geetttgana ngcanctetg gggeteange gaettteece cagggeecet
                                                                                                                                480
coatggazag gegecateca nigiteteig geaccigica geccaeceag itengetgea
                                                                                                                                54 D
nesatgycty otgoatenac antitectng astigtgaca acaececcca nigecceesa
                                                                                                                                600:
controvers assignt to the transparation of the control of the cont
                                                                                                                                660
                                                                                                                                720
enceteentt tteecenntn aacaaagge netngenttt gaactgeeen aaccenggaa
tetneenngg aasaantnee coccetggtt eetnmaance ceteenenaa anctneecce
                                                                                                                                780
                                                                                                                                783
           <210> 16
           <211> 801
           <212> DNA
           <213 > Homo sapien
           <220≻
           <221> misc feature
           <222> (1) ... (801)
          <223> n = A,T,C or G
           <400> 16
gececaatte cagetgecae accacecaeg gtgactgeat tagtteggat gtcatacaaa
                                                                                                                                 60
agotgattga agcaacooto tantittigg togtgagect titgottggt gcaggittea
                                                                                                                                120
ttggctgtgt tggtgaogtt gtcattgcaa cagaatgggg gaaaggcact gttctctttg
                                                                                                                                160
aagtagggtg agtootoaaa atoogtatag ttggtgaago cacagcactt gagcoottto
                                                                                                                               240
atggtggtgt tecacacttg agtgaagtet teetgggaac cataatettt ettgatggca
                                                                                                                                300
ggeactacca geaacgtcag gaagtgetca gccattgtgg tgtacaccaa ggcgaccaca
                                                                                                                                350
                                                                                                                               420
quaquetquaa cotraquaat qaaqatgaqq aggaggatga agaagaaogt cnoqagggca
cacttgetet cegtettage accatageag cocangaaac caagagcaaa gaccacaacg
                                                                                                                                480
congologia algaesgess nlaccosogi tgacsaacig calggocaci ggacgacagi
                                                                                                                                540
tggcccgaan atettcagaa aagggatgee ccatcgattg aacacccana tgcccactge
                                                                                                                               60¢
chacaggget geneenenen gaaagaatga gecattgaag aaggatente ntggtettaa
                                                                                                                               660
tgaactgaaa centgeatgg tggeceetgt teagggetet tggeagtgaa ttetganaaa
                                                                                                                                720
                                                                                                                               790
saggaachge nthageeree ccasangana saacseeree gygtgttyee etgaattyge
                                                                                                                               ន់បារ
qqccaaqqan ccctqcccch g
           <21D> 17
           <211> 74D
           <212> DNA
           <213> Komo sapien
           <220>
           <221> misc feature
           <222> (1)...(740)
           <223> n = A,T,C or G
           <400> 17
                                                                                                                                 БQ
gtgagageca ggogtecete tgeetgeeca etcagtggca acaccoggga getgttttgt
cetttgtgga geetcagcag tteectettt cagaactcae tgccaagage cetgaacagg
                                                                                                                               120
agecaccatg cagtgettea getteattaa gaecatgatg atcetettea attigeteat
                                                                                                                               180
                                                                                                                               240
ctttctgtgt ggtgcagccc tgttggcagt gggcatctgg gtgtcaatcg atggggcatc
ctttctgaag atcttcgggc cactgtcgtc cagtgccatg cagtttgtca acgtgggcta
                                                                                                                               300
                                                                                                                               350
cttecteate geageeggeg tigiggiett igeteiliggi tieeliggget gelaliggige
taagacggag agcaagtgtg coctegtgac gttottette atocteetee teatetteat
                                                                                                                                42D
tgctgaagtt gcagctgctg tggtcgcctt ggtgtacacc acaatggctg aaccattcct.
                                                                                                                                48D
gacgitgetg grantgeetg ccateaanaa agattatggg ticccaggaa aaattcacte
                                                                                                                               540
ashtnigges caccoccatg sessiggete esetticign tigectione sactalises
                                                                                                                               600.
gasttttgaa aganteneec tactteesaa aaaasanant tgeetttnee eesnttetgt
                                                                                                                                660
tgcaatgaaa acntcccaan acngccaatn aaaacctgcc cnnncaaaaa ggntcncaaa
                                                                                                                                720
```

caasaaant nnaagggttn

740

```
<210> 18
       <211> 802
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(802)
       <223> n - A,T,C or G
       <400> 18
 cesetssets esetsseca susuasceae gaageaeste ascatacaea secteaatea
                                                                         60
 caaggtette cagetgeege acattaegea gggeaagage etecageaae actgeatatg
                                                                        120
 ggatacactt tactitagca gccagggtga caactgagag gtgtcgaagc ttattottot
                                                                        180
 gagoctotgt tagtggagga agattcoggg ottcagotma gtagtcagog tatgtcormt
                                                                        240
 aagcaaacac tgtgagcagc cggaaggtag aggcaaagtc actotcagcc agctotctaa
                                                                        300
 cattigigicat giocagoagi tolocaaaca ogtagacaco agnigicoloc agcacotigat
                                                                        360
 ggatgagtgt ggccageget gerreettgg ergarttggr taggageaga aattgetret
                                                                        420
 ggttctgccc tgtcaccttc acttccgcac tcatcactgc actgagtgtg ggggacttgg
                                                                        480
geteaggatg tecagagaeg tygtteegee ceetenetta atgacaeegn ceanneaace
                                                                        540
gteggeteee geegantgng ttegtegtae etgggteagg gtetgetgge enetaettge
                                                                        600
sancticgic nggcccatgg asttracene aceggasein gtangatees cinnitetat
                                                                        660
aaccggnege caccgennnt ggaactecae tettnbinee thiactigag ggttaaggte
                                                                        720
accettning tracettggt ccaaacentii centgtgteg anatigtiaa tenggicena
                                                                        780
inccencenc stangaagee ng
                                                                        802
      <210> 19
      <211> 731.
       <212> DWA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(731)
      <223> 0 - A,T,C or 3
     <4QD> 19
cnaagettee aggtnaeggg cegenaance tgaccenagg tancanaang cagnengegg
gageccaceg teaegnggng gngtetttat nggaggggge ggagecaeat enetggaent
                                                                       120
cnigacecca actececnee neneanigea gigatgagig cagaacigaa gginacgigg
                                                                       180
caggaaccaa gancaaanne tgeteemnte caagtoggen nagggggegg ggetggeeae
                                                                       24 D
guncateent enagtgetyn aaageeeenn eetgtetaet tytttygaga aengennnga
                                                                       300
catgoccagn gitanataac nggongagag tnanttigec telecettec ggotgogcan
                                                                       360
construtet Lagregarat aacctearta cttaacteaa ccroogaate trecoccect
                                                                       420
ccactaaget cagaacaaaa aacttegaca ccaetcantt gtcacctgnc tgctcaagta
                                                                       480
asgiglacco caincocaat ginigoinga ngeloignee igentiangi teggicoigg
                                                                       540
gaagacctat caattmaagc tatgtttetg actgcctctt gctccctgna acaancmacc
                                                                       600
ennennteca agggggggne ggeecceaat ecceecaace ninaattman ittaneceen
                                                                       550
eccengace eageetttta enamentenn nnaenggma aaacennnge tttmcccaac
                                                                       720
nnaateenee t
                                                                       731
      <210> 20
     <211> 754
      <212> DNA
     <213> Homo sapism-
```

```
<220>
        <221> misc_feature
        <222> (1)...(754)
        c223> n = A,T,C \text{ or } G
       <400> 20
 ttttttttt tttttttt taaaaseece eteestmaa tgesactte egaasttgte
                                                                         60
 caacccctc ntccaaatnn contttocgg gngggggtto caaacccaan ttanntttgg
                                                                        120
 annttaeatt saatnitnnt tggnggnnna anccnaatgt nangasagit nascccants
                                                                        180
 tnanctinas ineciggasa congingnit coassasini tiaseccita anicociog
                                                                        240
 aaatngttna nggaaaaccc aanttotont aaggitgitt gaaggninaa inaaaanccc
                                                                        300
 nnocaattgt tittingoodo gootgaatta attggnttoo gntgttttoo nttaaaanaa
                                                                        360
 ggmnencere ggttentnaa teeececnne ceeastesta ceganttitt tingaattgg
                                                                        42D
 gamecenegg gaattaaegg ggnnnnteec thttgggggg enggnneece eccenteggg
                                                                        48D
 ggttngggnc aggnennaat tgtttaaggg teegaaaaat eeeteenaga aaaaaanete
                                                                        540
 ceasgntgag notngggttt nececcece canggeecet etegnanagt tggggtttgg
                                                                        600
 aggacctagg attitutte cectnituce teececcee congaganag aggituguat
                                                                        660
 titignicanc ggeceeneen aagamettin eegantinam tiaaateeni geeinggega
                                                                        720
 agtcenttgn agggntaaan ggeceeetnn eggg
                                                                       754
       <210> 21
       <211<sub>> 755</sub>
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(755)
       <223> n = A,T,C or G
atcancecat gaececnaac nngggaeene teanceggne nnnenaeene eggeenatea
                                                                        60
nngtnagnne actnennttn nateaeneee encemaetae gecemenane enaegeneta
                                                                       120
nncanatnee actganngeg ogangtngan ngagaaanet nataccanag ncaccanacn
                                                                       180
ccapetgted nameangest numeracings numaticeast ntgnancets chaagtattn
                                                                       240
nnenncanat gattitecth ancegattac controccce tanccectec cecccaacha
                                                                       3DQ
cgaaggenet geneenaagg magegmenee eegetagnte eeenneaagt enemeneeta
                                                                       360
aacteaneen nattaenege ttentgagta teacteceeg aateteacee tacteacee
                                                                       420
asakanaten gatarapaat aatneaagee tenttatnae actntgarte getetetatt
                                                                       480
tragnggice minaamente ctaatactie cagietneet temecaatit cemaangget
                                                                       540
etttengaca geatnittig gitteennit gggitettan ngaatigeee tieningaac
                                                                       600
gggetentet titteettegg timeetggn tienneegge cagttattat tiecentiti
                                                                       660
aeattentne entttanttt tegenttena aececcoge ettesaace gecccetegt
                                                                       720
aaaaggtigt ittganaaaa tittigtiit giicc
                                                                       755
     <210> 22
      <211> 849
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> {1}...{849}
      <223> n = A,T,C or G
      <400> 22
Etttttttt tttttangtg tngtogtgca ggtagaggct tactacaant gtgaanacgt
```

acgetnggan taangegace eganttetag gannenceet aaaateanae tgtgaagatn

```
atortganna ogganngste accognagat natgetaggg typecactee cannacatta
                                                                        180
cataacteng nggecetgee caccacctte ggcggcccng ngnccgggce cqqqtcattn
                                                                        240
gnnttaacen cactnogena neggitteen necconneng acconggega teoggggine
                                                                        3 D D
tetgtettee eetgmagnen anaaantggg ceneggneee etttaceeet nnacaageea
                                                                        36D
engeenteta neenengeee cecetecant nngggggact geenannget cegttnetng
                                                                        420
nnaccconnn gggtncctcg gttgtcgant chaccgnang ccanggattc chaaggaagg
                                                                        480
tgegttattg geceetaere ttegetnegg nneaccette ecgaenanga neegeteeeg
                                                                        540
channeging eftenected chackeege netentengt neggninece ecceaecoge
                                                                        600
necetenene ngnegnamen etecneence stetcannea ecacecegoe ecgecaggee
                                                                        660
nteanceach ggmngaching nagemennte geneegegen gegmeneest egechengaa
                                                                        720
ctnentengg coantinege teaancenna enaaacgeeg etgegeggee egnagemee
                                                                        780
nectoencya stretteren etternacee anguntteen egaggaraen unacceeque
                                                                        840
nncangegg
                                                                        B49
      <210> 23
      <211> 872
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(872)
      \langle 323 \rangle n = A,T,C or G
      c400> 23
gegeasacta tacttegete gnactegtge geotegetne tetttteete egeaaceatg
                                                                        6 D
tetgachane eegattugge ngatatenan aagntegane agteeaaact gantaacaca
                                                                       120
cacachenan aganasatee netgeettee anagtanaen attgaaenne agaaecange
                                                                       180
nggegaateg taatnaggeg tgegeogeca atnigtonee gittatinin ecagonione
                                                                       240
etneenacce taentetten nagetgtenn acceetngth egnaceece naggtegga
                                                                       30Q
teggsttton untgaregng ennecerter correters nacyancene cegcaccace
                                                                       360
namngenege neesegnnet ettegeenes etgteetnin eesetginge etggenengn
                                                                       420
acogcattga ecctogeenn etnenngaaa negnanaegt eegggttgnn annanegetg
                                                                       480
tgggnnngeg tetgeneege giteetieen nennetteem eemiettent taengggiet
                                                                       540
cenegeente tennnesene entgggange introinige coccettnae teoccecett
                                                                       600
egnegignee egneceeaec nicatithea naegnicite acaamnneet ggminnetee
                                                                       550
chancegnen greatechag ggaagggegg ggmmeenntg ntrgacgttg nggegangte
                                                                       720
cgaanantcc tencentean enctaceeet egggegnnet etengtinee aacttaneaa
                                                                       780
ntoteccor agagements teagestens conceenat stotecants thetetests
                                                                       840
tnacenntac gantnitegn encectetti ce
                                                                       872
      <210> 24
      <211> 815
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(8)5)
      <223> n = A, T, C or G
      <4DD> 24
gcatgcaage ttgagtatte tatagngtea cetaaatane ttggentaat eatggtenta
                                                                        60
netynettee tytyteaaat gtataemaan tanatatgaa tetnatntga caagannyta
                                                                       120
tentucatta giaacaanig innigieest eetgiengan canatteesa innatinega
                                                                       180
egeattenen geneantato taatogggaa otennotoon neacenneat etatentoee
                                                                       24 D
geneerigae iggnagagai ggainamite inminigaes masaigitea teliggailm
                                                                       30D
aananeeece egengneeae eggttngnng enageennte ccaagacete etgtggaggt
```

```
aacetgegte agannestes aacntgggaa accegennee angtnnasgt ngnnneanan
                                                                        42D
 gatecegtee agentinace atceetiene agegeneest tingigeett anagngnage
                                                                        420
 gtgtccnanc enctcaacat ganaogegee agneeanceg caattnggea caatgtegne
                                                                        540
 gaacecceta gggggantna theadancee caggattete enemeangaa atecencane
                                                                        600
 cocnecetae connetting garnginger aanteeegga gineeagter ggrengnete
                                                                        660
 erecaceggt meentgggg gggtgaanet engnnteane engnegaggn ntognaagga
                                                                        720
 accegonetto egnogaanng ancontenga agngconent egtataacce coocteneca
                                                                        780
 nccmacngnt agnicocccc engggtnegg aangg
                                                                        815
       <210> 25
       <211> 775
       <212> DNA
       <213> Nomo Bapien
       <220>
       <221> misc feature
       <222× [1] ... (775)
      <223> n = A,T,C or G
       <400> 25
 ecgagatyte tegeteegty geettagety tyotogeget actotetett tetygeetyy
                                                                         60
 aggetateca_gegtaeteca_aagatteagg_tttaeteaeg_teatecagea_gagaatggaa_
                                                                       120
 agtomaattt ectgamitge tatgtgtetg ggtttemter atcegmentt gmanttgmet
                                                                       180
 tactgeages tgganagegs attgessesg tggagcettc agecttgtct ttcagcaagg
                                                                       24B
 actggtettt etatetentg tactacactg aatteacccc cactgaaaaa gatgagtatg
                                                                       30D
 cotgoogtet gaaccatgte actitetoac agoccaaeat agttaagteg gatogagaca
                                                                       360
tgtaagcagn concatggaa gtttgaagat geegeatttg gattggatga attecasatt
                                                                       420
etgetigett gentittaat antgatatge ntatacacce taccetttat gnocccaeat
                                                                       480
tgtaggggtt acatmantgt tementngga catgatette etttataant cencentteg
                                                                       540
aattgeeegt encoungtto ngaatgitte ennaaceaeg giiggeteee ceaggience
                                                                       600
tettacggaa gggeetggge enettineaa ggtiggggga acchaaaatt tenetinige
                                                                       560
conceences contetting meneantit ggaaccette coatteecet tggeetenna
                                                                       720
ncottnnota, anasaacttn saanoginge nasannittn setteegee tisee
      <210> 26
      <211> 820
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (820)
      <223> n = A,T,C'or G
      <400> 26
anattantac agtgtaatct tttcccagag gtgtgtanag ggaacggggc ctagaggcat
                                                                        60
creanagata nettatanca acagigetit gaccaagage igeigggese alliceigea
                                                                       120
gasaaggtgg cggtccccat cactcctcct ctcccatage catcccagag gggtgagtag
                                                                       180
ccatcangec tteggtggga gggagtcang gaaacaacan accacagage anacagacca
                                                                       240
ntgatgacca tgggcgggag ogagcctett ceetgnaccg gggtggcana nganagccta
                                                                       300
netgagggt cacactataa acgttaacga cenagatnan cacctgette aagtgeacce
                                                                       360
tteetacetg acmaccagng accmmaact gengeetggg gaeagenetg ggancageta
                                                                       420
acmnageact cacetgeece cocategeeg tregenteec tegteetene aaggeaaget
                                                                       4 B 0
cortattaga attnegggga naccaaggga nereceteet ceanetatga aggasaasnn
                                                                       540
g tggaattt inccetteeg geennieses tetteetta caegeesest untactente
                                                                       60D
tecetetntt nteetgmene acttttnace commattte ecttnattga teggannetn
                                                                       660
ganatteese tonegeetne entenateng maanacnaas nactnicina econgggat
                                                                       720
gggnnecteg ntestectet etttttenet acencenntt etttgeetet eettngates
```

treascente gatgeenta eccecenna tecttinece

```
<210> 27
         <211> 818
         <212> DNA
         <213> Homo sapien
         <220>
         <221> misc feature
         <222> (1)...(818)
         <223> n = A, T, C or G
         <400> 27
   totgggtgat ggoctettoc toctcaggga cototgactg ctotgggcca aagaatetet
   tgtttettet eegageeeca ggeagoggtg atteageest geceaacetg attetgatga
                                                                        120
   ctorggator totoacogae ccaaoggges aataoggtee cagggtecag ggaggggege
                                                                        180
   ctgccgagea cttccgcccc tcaccctgcc cagcccctgc catgagetet qqqctqqqtc
                                                                        240
   teegectica gggttetget ettecangea ngccancaag tggcgetggg ccacactqqe
                                                                        300
   ttatteetga coentacetg getetgante tetgtettee tgteetgtge angeneettg
                                                                        360
   gatoteagit tooctonoto anngaactot gitteigann Lottoanita acintganit
                                                                        420
   tatmaccnan tegenetetne tetenmactt taategegeen gacoggotaa teceteeste
                                                                        480
   netecettee anttennnna accogettne ententetee centaneceg congggaane
                                                                        54D
   ctcctttgcc ctnaccangg gccnnnaccg cccntnnctn ggggggcnng gtnnctncnc
                                                                        600
   etghtnacce coctenent treetegice conconegen nogeannite neogiecenn
                                                                        660
   thnetetten ngintegnaa ngmienenin innunngnen ngminninen teestetene -
                                                                        72D
   connigrang instinuous sengosecc nonnessons sgementamo tetremesge
                                                                        780
   cconnecece ngnattaagg ceteenniet eeggeene
                                                                        818
        <210> 28
         <211> 731
         <212> DNA
        <213> Homo sapien
        <220>
        <221> misc_feature
        <222> (1)...(731}
        <223> n = A, T, C or G
   aggaagggcg gagggatatt gtangggatt gagggatagg agnataangg gggaggtgtg.
                                                                        60
   tereaacatg anggtgnngt tetetitiga angagggits ngittitaan cengginggi
                                                                        120
   gattnaacco caffgtafga agnmaaaggn titnagggat tittcagcic tiatcagfat
                                                                        180
  ntanattect ginaategga aaatnatnit tennenggaa aainitgete ecateegnaa
                                                                        24 D
  attnetceeg ggtagtgeat ntingggggn engecangit teceaggetg ctanaategt
                                                                        300
  actaaagntt naagtgggan tucaaatgaa aacctnucac agagnateen taccogactg
                                                                        360
  thunttheet tegecethig actetgenny ageccaatae congranat grencengn
                                                                        420
  nniquenció teasanonne trangartini gancatrana agatttages tessasageni
                                                                       480
  egittenest neaggeacti ingecieate caaceneing ecctenness titingeegie
                                                                       540
  nggtteneet aegetnning enectnnnin ganatittine eegeeinggg naaneeteet
                                                                       600
  gnaatgggta gggnettnie tittnaeenn gnggintaet aatenneine aegeninett
                                                                       560
  totenacco coccettitt caateeeane ggenaatggg gtoteccenn cgangggggg
                                                                       720
  nnneceanne e
-- -- <210> 29
<212> DNA
      ~<213> Homo aapien
```

```
<220>
      <221> misc feature
      <222> (1) ... (822)
      <223> n=A,T,C or G
      <400> 29
actageocag tgeggeggaa teccategeg teggggnene etcetatgant anenteagat
                                                                        бů
egeteanace teacaneete cenacnange etataangaa nannaataga netginemnit
                                                                       120
athintache teatannect emmaceeae teestettaa seentaetgt gestatngen
                                                                       180
thnetaltet ntgreggeth chanceacon gtgggernac encunghatt ctchatetee
                                                                       240
tenecatnin gertamanta ngineatace ciatacetae necaaigeta nonetaanen
                                                                       300
tecatnantt annntageta ceaetgaent ngaetttene atnaneteet aattigaate
                                                                       36D
tactotgact cocaengect annuattage anenteccec nacuatintet caaccacate
                                                                       420
nteaaceace tatetanety thenceace ntincetecy atccconnac aaccccctc
                                                                       480
ccasatacco necescigae nectaaccon caccateceg geaageenan ggneatitan
                                                                       54 D
ccactggaat cachatngga naaaaaaaac conaactoto tancnonnat ctccctaana
                                                                       600
aatnoteetn naatttactn neantnecat caancecach tgaaachnaa ceestgitti
                                                                       660
tanatecett etttegaaaa cenaceett annucceaae ettinggged ecccencine
                                                                       720
consetgang gnoncocast changasang nechtgassa anchangens anamhteeg
                                                                       780
canatoctat coettantin ggggnccett necenggge ce
    ~210> 30 ---
      <211> 787.
      <212> DNA
      <213> Romo sapien
      <220>
      <221> misc_feature
      <222> (1),..(7B7)
      \langle 223 \rangle n = A,T,C or G
      <400> 30
eggeegeetg etetggeaca tgeeteetga atggeateaa aagtgatgga etgeecattg
ctagagaaga cottototoc tactgtoatt atggagooot goagactgag ggotoccott
                                                                       320
                                                                       180
ptotgoagga titigatgiot gaagtogigg agigtggott ggagotooto atotacatna
gerggaagee etggaggee teteregeea geeteereet teteteearg eteterange
                                                                       240
acaccagggg ctccaggcag cocattattc ccagnangae atggtgtttc tccacgcgga
                                                                       300
occatggggc otgnaaggcc agggteteet ttgacaccat etetecegte etgectggca
                                                                       360
ggecgtggga tecactantt etanaaoggn ogceaceneg gtgggagete cagettttgt
                                                                       420
tecenttaat gaaggitaat igenegetty gegiaaleat nggteanaac intitocigi
                                                                       480
gigasatigi tinicoccie nenaticone nenacataen asceeggaan catasagigi
                                                                       540
taaageetgg gggtngeetn nngaatnaae tnaacteaat taattgegtt ggetcatgge
                                                                       600
ecgettteen ttenggaaaa etgtenteee etgenttnnt gaateggeea ecceeenggg
                                                                       660
asaageggtt tgenttttng ggggnteett cenetteece cetenetaan ceetnegeet
                                                                       720
rggtcgttnc nggtngcggg gaangggnat mnctcccnc naagggggng agmnngntat
                                                                       780
CCCCRAA
     . <210> 31
      <211> 799
      <212> DNA
      <213> Homo Bapien
      <220>
      <221> misc feature
      <222> (1) ... (799)
    ...<223> n = A, T, C or G ......
```

<400> 31

```
tüttüttet tettitigge gatgetacig titaaitgea ggaggigggg gigigigiae
                                                                         60
catgtacceg ggctattaga agcaagaagg aaggagggag ggcagagcgc cotgctgagc
                                                                        130
aacaaaggac teetgeagee ttetetgtet gtetettgge geaggeacat ggggaggeet
                                                                        180
cccgcaggt gggggccacc agtccagggg teggagcact acanggggtg egagtgegta
                                                                        240
giggotogin chariggest greacanate cetacgatte tigacacetg gatticacea
                                                                       300
ggggacette tgitetecea nggnaactic ninnateten aaagaacaca actstitett
                                                                       360
engeanttet ggetgtteat ggaaageaca ggtgteenat tinggetggg acttggtaca
                                                                       420
tatggttcog geocacctet countenaan aagtaattea eccepteden contetnite
                                                                       480
cotgggccct taantaccca caccggaact canttantta ttcatcttng gntqqqcttq
                                                                       540
nthatuncon cotgaangeg coaagitgaa aggccacgee ginccencie eccatagnan
                                                                       600
nttttnnent canctaatge ceeceengge aacnateeaa teeceeceen tgggggeece
                                                                       660
agreeangge eccegnetes gymnocongn enegmantee ecaggnitete ceantenane
                                                                       720
commigence ecceptacyta gaacanaagy ntogageent egcannonno nggtonenae
                                                                       780
ctogeccee connegning
                                                                       799
      <210> 32
      <211> 789
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      c222> (1)...(789)
      <223> n = A,T,C or.G
      <400> 32
tittititt bettettet bettettet titttett tittitti tittitti ittittit
                                                                        60
tittnesmag ggcaggitta tigacaacci cnogggacae aancaggoig gggacaggae
                                                                       120
ggcaacaggo tooggoggog goggoggogg coctacotae ggtaccaaat ntgcagcete
                                                                       180
egeteeeget tgatntteet etgeagetge aggatgeent aaaacaggge eteggeentn
                                                                       240
ggtgggcacc ctgggatttm aatttecacg ggcacaatgc ggtcgcancc cctcaccacc
                                                                       300
nattaggaat agtggtntta econocnocg ttggcncact eccentggaa accaettnte
                                                                       360
goggetorgs catchagtet taeacettge assencing geoctettit tagtismint
                                                                       420
ncongecaca atcatnacto agactggene gggetggece eaaaaaanen ceccaaaace
                                                                       48D
ggnccatgic tinneggggt tgetgenath theateaest ecegggenea neaggncaae
                                                                       540
ccasaagtic tignggccon caaaaaandt dcggggggnd ccaglittcaa caaagtcatc
                                                                       600
occottages consented correspont netgagiting gasacesec cetetonett
                                                                       660
tggnnggcaa gntggnteec cettegggee eeeggtggge eennetetaa ngaaazenee
                                                                       720
ntectnanca ceatecece anganaegae tancaangaa teeettett tanaaaeggg
                                                                       780
accapeneg
                                                                       789
      <210> 33
      <211> 793
      4212> DNA
     <213> Homo sapien
      <220>
     <221> misc_feature
      <222> (1) ... (793)
     <223> n = A,T,C or G
     <400> 33
gacagaaca gttggatggt ggagcacctt tctatacgac ttacaggaca gcagatgggg
astteatgge tgttggagea atamasecee agttetacqa getgetgate aasggaettg
                                                                      12D
gactaaagtc tgatgaactt cocaatcaga tgagcatgga tgattggcca gaaatgaana
                                                                      180
agaagtttgc agatgtattt gcaaagmaga cgaaggcaga gtggtgtcaa atctttgacg
                                                                      240
gcacagatgo otgtgtgaet ceggttotga ettttgagga ggttgttoat catg teaca
                                                                      300
aceangeacg gggetegttt atcaccantg aggageagga egtgageeer egecetgeac
                                                                      -360
```

```
ctotgetgtt aaacacccca gocatccctt ctttcaaaag ggatccacta cttctagage
                                                                        420
ggnegecaec geggtggage tocagetttt gtteeettta gtgagggtta attgegeget
                                                                        480
tggogtaatc atgotcatan ctgtttcctg tgtgaaattg ttatccgctc acaattccac
                                                                        540
aceacateog encoggaego atnasatitt seegootggn ggingcotea igantgeect
                                                                        600
nacteacott sottggettt gegeteactg coegetttee agteeggasa acctgteett
                                                                        660
gecagetgee nttaatgaat enggecacee eeeggggaaa aggengtitg efintigggg
                                                                        720
egenetices getttetege tteetgaant cetteecees ggtettegg ettgeggena
                                                                        780
                                                                        793
acggtatena cet
     1c210>-34
      <211> 756
      <212> DNA
      <213> Homo sagien
      <220>
      <221> misc_feature
      <222> (1)...(756)
      <223> n = A, T, C or G
geogogacog geatgtacga geaacteaag ggogagtgga accetaaaag coccaatett
                                                                        60
ancaagtgcg gggaanaget gggtcgacte aagetagtte thetggaget caacttettg
                                                                       120
cceaccaceg ggaccaaget gaccaaacag cagctaatte tggcccgtga catactggag
                                                                       180
atoggggece aatggageat cetaegeaan gaeateeeet eettegageg etaeatggee
                                                                       240
cagotoanat gotactactt tgattacaan gagongotoo cogagtongo otatatgono
                                                                        300
cagetettgg geetraaret eetettreetg etgteeraga acceggetgge tgantnerac
                                                                       360
acggantiqg ancoretqce tgcccaanga catacanacc aatgtctaca tenaccacca
                                                                       420
gtgteetgga geaataetga tgganggeag etaceneaaa gtntteetgg eenagggtaa
                                                                       480
catecorege egagagetae acettettea tigacateet getegaract atcagggatg
                                                                       540
aaaategeng ggttgeteea gaaaggetne aanaanatee tittenetga aggeeeegg
                                                                       600
atmonotagt notagaateg geoegecate geggtggane etecaacett tegttmeeet
                                                                       660
ttactgaggg ttnattgccg cccttggcgt tatcatggtc acnccngttn cctgtgttga
                                                                       720
aattnitaac ceccecaat tecaegeena cating
                                                                       756
      <210> 35
      <211> B34
      c212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (834)
      <223> n = A,T,C or G
   ~ <400>:35,
ggggatetet anatomacet gmatgcatgg ttgtcggtgt ggtcgctgtc gatgaamatg
                                                                        60
aacaggatet tgeeettgaa getetogget getgtnttta agttgeteag tetgeegtea
                                                                       120
tagteagaca enetettggg caaaaaaean caggatntga gtettgattt cacetecaat
                                                                       180
                                                                       240
aatottengg getgtetget eggtgaacte gatgaenang ggeagetggt tgtptntgat
                                                                       300
azantocano augitotoct tygtgacete coetteaaag ttgiteegge etteateaaa
                                                                       36D
ottotnnaan angannanco cancetegto gagotggnat tegganaaca ogecacegte
ggsaartgat cccaastggt atgtcatcca tcgcctctgc tgcctgcasa saacttgctt
                                                                       42D
ggeneaaate egacteeren teettgaaag aageenatea caeeeeette ootggactee
                                                                       480
nncaangact cincogcine coenteenng cagggitggi ggcanncogg gecentgege
                                                                       540
                                                                       600
ttetteagee agricaenat niteateage coetetgeea getgitniat teetiggggg
ggaancogte beteeettee tgaannaact ttgaeegtng gaatageege genteneent
                                                                       660
achtretggg coppgiticas anteceteen tighennien eetegggees tietggatti
                                                                       720
```

ncenaactit tiecticeed encodencyg nyttiggnit titeatnygg coodaactot

```
getottggee antecepting gagenthean encorectat gatecentag ages
                                                                        834
       <210> 36
       <211> B14
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) ... (814)
       \langle 223 \rangle n = A.T.C or G
      <400> 36
eggnegettt cengeegege reegttteea tgacnaagge teestteang ttaaatachn
                                                                         бD
cctagnaaac attaatgggt tgctctacta atacatcata cnaaccagta agcctgccca
                                                                        120
nasogocaac teaggedatt detaceaaag gaagaaagge tggteteted acceeetgta
                                                                        180
ggaaaggeet geettgtaag acaccacaat neggetgaat etnaagtett gtgibbtbact
                                                                        240
aatggaaasa saasataaac aanaggtttt gttotoatgg ctgcccacog cagcctggca
                                                                        300
ctaaaacanc ccagcgctca cttctgcttg ganaaatatt ctttgctctt ttggacatca
                                                                        360
ggottgatgg tatcactgec acntttecac ccagetgggo necotteccc catnititate
                                                                        420
antganctgg esggcctgea nottagtotc cassegtotc ngoccaceag acoggccaco
                                                                        480
aggggangte ntitneagtg galetgeesa anantaceen taleatennt gastaassag
                                                                        540
geocetgaac ganatgette cancaneett taagaceeat aateetngaa ceatggtgee
                                                                        600
etteeggtet gateenaaag gaatgtteet gggteeeant coeteettig tinettaegt
                                                                        660
tgtnttggac centgetngn atnacecaan tganateere ngaageacee tneceetgge
                                                                        720
attigantit entalatict etgecetaen netgaaagea enatteeetn ggeneenaan
                                                                        780
ggngaactca agaaggtetn ngaaaaacca enen
                                                                        814
      <210> 37
      <211> 760
      <212> DNA
      <213 > Romo sapien
      <220>
      <221> misc feature
      <222> (1)...(76D)
     .<223> n = A,T,C or G
      <400> 37
gratgetget ettecteaaa gitgitetig tigerataar aaccaccata ggiaaagegg
                                                                        60
gegeagtgtt egetgaaggg gttgtagtae cagegeggga tgcteteett geagagteet
                                                                        120
gtgtetggca ggtecacgca atgecetttg teactgggga zatggatgeg etggageteg
                                                                        180
tonaanceae tegtgtattt tteacanges geeteeteeg sagenteegg geagttgggg
                                                                        240
giglegicae actecaetaa actgiegain cancagerea tigeigeage ggaacigggi
                                                                        300
gggetgacag gtgccagaac acactggatn ggcctttcca tggaagggcc tgggggaaat
                                                                        360
cocotnance caaactgeet eteaaaggee acettgeaca eccegacagg etagaaatge
                                                                        420
actettette ceaaaggtag ttgttettgt tgeceaagea neetceanea aaecaaaane
                                                                        480
ttgcaaaatc tgctccgtgg gggtcatnnn taccanggtt ggggaaanaa acccggcngn
                                                                        540
gancenectt gtttgaatge naaggnaata ateeteetgt ettgettggg tggaanagea
                                                                        600
castigeact gitaecnitg ggccgngtic cncingggig gictgaaact aatceccgic
                                                                        660
actggaaaaa ggtangtgcc ttccttgaat tcccaaantt cccctngntt tgggtnnttt
                                                                       72D
etectetnee etaaaaateg totteeceee centanggeg
                                                                        76 D
      <210> 38
      <211> 724
      <212> DNA
      <213> Homo sapier
```

```
<220×
      <221> misc feature
      <222> (1) . . . (724)
      <223> n = A,T,C or G
      <400× 38
                                                                        бQ
ttettette tettettet ettettet ettetaaaa cocceecat igaatgaaaa
etteenaaat tyteeaacce cetemneeaa atmmeeattt cegggggggg gtteeaaace
                                                                       120
caaattaatt tiggantita aattaaatni inattngggg aanaanccaa atginaagaa
                                                                       1BO
astitaaccc stistnaact taasincein gaasceenig gnitteessa siittiasee
                                                                       240
ctteaatece teegaeatty nteanggaam accammitten eetmaggetn titgaaggtt
                                                                       300
ngatttaaac ccccttnant intittnacc enngnetnaa ntattingni tccggigtit
                                                                       360
tectnttaan entnggtaac tecegntaat gaannneest aanecaatta aacegaattt
                                                                       420
tttttgaatt ggaaatteen ngggaattna coggggtttt tecentttgg gggecatnee
                                                                       480
ccenctttcg gggtttgggn ntaggttgaa tttttnnang ncccaaaaaa ncccccaana
                                                                       540
adammactee campunttaa tengaatnie eeeetteeea ggeettitgg gaaaggnggg
                                                                       600
tttntggggg congggantt entteeccon ttnccncccc ccccconggt asangsttat
                                                                       660
ngnntttggt ttttgggecc ettnanggac etteeggatn gaaattaaat eecegggneg
                                                                       720
                                                                       724
g¢¢g
      <210> 39
      <211> 751
      <212> DNA
      <213> Homo sapien
      <220>
      c221> misc_feature
      <222> (1)...(751)
      <223> □ □ A,T,C or G
      <400> 39
tertettet tertettig eleacateta attitatit igattettit taatgetgea
                                                                         60
Cascacaata titatticat Eigittettt tatticatet tattigittig eigetgetgt
                                                                        120
tttatttatt tttactgasa gtgagsggs acttttgtgg ccttttttcc tttttctgta
                                                                        180
ggccgcctta agctttctax atttggaaca tctxagcaag ctgaanggaa aagggggttt
                                                                        240
ogcamatom cheggoggam nggmamagett getttettam temteceta tegteggeter
                                                                        300
thascigett graduatted nitrocetti tautiantig tydinaange iitaattana
                                                                        36 D
cttgggggtt ccctccccan accaaccccn ctgacaaaaa gtgccngccc tcaaatnatg
                                                                        420
teceggennt entigazaca caengingaa ngiteteati nicecenene cagginaaaa
                                                                        480
tgaagggtta ccatntttaa enceacetee aentggennn geetgaatee tenaaaanen
                                                                        540
occtemenca sattuctung cocceggione gentungtee encoceggget cegggmanta
                                                                        600
cacccenga annenntnne nascnaastt eegsaaatat teeenntene tesatteeee
                                                                        660
chnagaetht cetennenan encaattite tittonicae gaacheghne ennaaaatgh
                                                                        720
                                                                        751
minnenecte enetngteen naateneean e
       <210> 40
       c211> 753
       <212> DNA
       <213> Homo sapien
       <220>
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       c2235 n = A, T, C or G
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                                                                         60
 agatgasaac ccccccgaga cagcagcact gcaactgcca agcagccggg gtaggagggg
                                                                        120
```

```
egeentatge acagetgggn cottgagada geagggette gatgteagge tegatgteaa
                                                                     180
tggtetggaa goggeggetg tacetgegta ggggeacace gteagggeec accaqqaact
                                                                     240
totoakagit ocappoaaon togttgogad acadeggaga deaggigain agottggggt
                                                                     300
cggtcataan cgcggtggcg tegtegetgg gagetggeag ggeeteeege aggaaggena
                                                                     360
atasaaggty cgcccccca ccgttcanct cgcacttctc naanaccatg angttgqqct
                                                                     420
charcecare accanneegy acticetty negatiteec anatetette entettyqqe
                                                                     490
ttetnetgat geectanetg gitgeeengn atgecaanea necesaanee eeggggteet
                                                                     540
600
gganeccata totonaccan tactcacent nececcent gnnacceane ettetannon
                                                                     660
tteeeneeg neetetggee entessanan gettnesena eetgggtetg cetteeeeee
                                                                     720
incoctatet gnaccoomen titgictean int
                                                                     753
      <220> 41
      <211> 341
      <212> DWA
      <213> Homo sapien
      <400> 41
actatateca tearaacaga catgettest constagact tettgacata getteasatg
                                                                      6D
agigaaccca tootigatii atalacatai aigiteteag tattiiggga geetticeae
                                                                     120
ttetttaaae ettgtteatt atgaacaetg aanataggaa tttgtgaaga gttaanaagt
                                                                     180
tatagettet ttacetagta agtititegaa gietacatte aatecagaca ettagtigag
                                                                     240
Egitaaactg Egatititaa aassisteat tigsgastat tetticagag gtattiteat
                                                                     300
ttttactttt tgattaattg tgttttatat attagggtag t
                                                                     341
      c210> 42
      <211> 101
      <212> DNA
      <213> Homo magien
      <400> 42
acttactgaa titagitictg tgricticci tattiagigt tgiatcataa atactitgab
                                                                     60
gtitcaeaca ticteeatae ateattitca giggcitcat e
                                                                    101
      <210> 43
      <211> 305
      <212> DNA
      <213> Homo mapien
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                                                                     60
tocaggging totcacers tastragage tattgaggag totttacage asattaagat
                                                                    120
teagabgeet tgetaagtet agagttetag agttatgttt cagaaagtet aagaaaceea
                                                                    180
cotottgaga ggtcagtaaa gaggacttaa tatttcatat ctacaaaatg accacaggat
                                                                    240
tggatacaga acgagagtta teetggataa etragagetg agtacetgee egggggeege
                                                                    300
togaa
                                                                    305
     <210> 44
     <211> 852
     <212> DNA
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     <221> misc_feature
     <222> (1) ... (852)
     <223> n = A,T,C or G
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acatasatat cagagasaag tagtottiga aatatitacg tocaggagit cittottot
                                                                       ឥ៧
gattatttgg tgtgtgtttt ggtttgtgtc caaagtattg gcagettcag ttttcatttt
                                                                      120
ctotocatoc togggoatte ttoocaaatt tatataccag tottogtoca tocacacgot
                                                                      180
ccagaattte tettitgtag taatatetea tagetegget gagettttea taggteatge
                                                                      240
tgotgttgtt ottotttta occoatagot gagocaotgo ototgattto aagaacotga
                                                                      BOE
agacgecete agateggiet toccattita ttaateetgg gitettgiet gggitcaaga
                                                                      36.D
ggatgtegeg gatgaattee cataagtgag tecetetegg gtlgtgettt tlgglgtge
                                                                      42D
acttggcagg ggggtcttgc tecttttca tatcaggtga ctctgcaaca ggaaggtgac
                                                                       480
togtogtbyt categeagate toegecegge agaeagetet getyteceae aaatetactg
                                                                      540
tgctaccata ghtggtgtca tataamtagt tctngtcttt ccaggtgttc atgatggaag
                                                                      600
gotcagtttg thraghottg acaatgacat tgtgtgtgga otggaacagg tcactactgo
                                                                       660
actggccgtt ccacttcaga tgctgcaagt tgctgtagag gagntgcccc gccgtccctg
                                                                      720
cogcecyggt gaactootge asacteatge tgcsssggtg etegeogttg atgtegaset
                                                                       780
cntpgaaagg pataceattg gcetcreger ggttggtgtc ceggeggtga tggegccect
                                                                       B40
                                                                       B52
cccacacctq qt
      <210> 45
      <211> 234
      <212> DNA
      <213> Homo Bapien
      aceacegece cttgctcgct eacgacctca tgctratcae gttggacgea tccgtgtccg
                                                                        ĸ'n
agtotgacac catooggago atcagoattg ottogoagtg cootacogog gggaactott
                                                                       120
geotegitte tegetegggt etgeteggega acggezgaat gestacogitg etgezgitgeg
                                                                       180
tgaacgtgtc ggtggtgtct gaggaggtct gcagtaagct ctatgacccg ctgt
                                                                       234
      <210> 46
      <211> 590
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(590)
      c223> n + A,T,C or G
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                                                                       120
atttgatage aatattttgg agattacaga gittlagiaa tiaccaatta cacagitaaa
angangatan tatatteena gennataena natatetaat gaangateaa ggeaggaaan
                                                                       18D
tgentataac taattgacaa tggaaaatca attttaatgt gaattgcaca ttatecttta
                                                                       240
aaagetttea aaanaaanaa ttattgeagt etanttaatt eaaacagtgt taaatggtat
                                                                       300
caggataaan aactgaaggg canaaagaat taattttcac ttcatgtaac ncacccanat
                                                                       360
ttacastggc ttasstgcan ggabbabagca gtggabgtag ggabgtantc saggtctttc
                                                                       420
                                                                       480
tggtctctam totgccttmc totttgggtg tggctttgat cototggmaga cagotgccag
                                                                       540
ggotootgit atalocacaa loocagoago aagalgaagg galgaaaaag gacacalgol
                                                                       590
geetteett gaggagaett cateteactg gecaacaete agteacatgt
      <210> 47 .
      <211> 774
      <212> DNA
      <213> Homo sapien
    <220>
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<221> misc_feature <222> (1)...(774) <223> n = A,T,C or G

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                                                                       60
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                                                                      120
getteactge tigasactta aatggetgig ggacanaatt tietgtaatg accetgaggg
                                                                      180
cattacagac gggactrtgg gaggaaggat aaacagaaag gggacaaagg ctaatcccaa
                                                                      240
ascatessag asaggaaggt ggogtestad eteccageet seacagttet ecagggetet
                                                                      300
ceteatecet ggaggaegae agtggaggaa caactgacca tgtccccagg etcetgtgtg
                                                                      360
diggeteets gicticages escapelets gaagedcace cictgetgat deigegings
                                                                      420
ccacacteet tgaacacaca torccaggtt atattectgg acatggetga acctoctatt
                                                                      4 B O
cetactices agatectits etecetoras cetotranaa teccacteas estecamace
                                                                      540
acggcatggg aagcetttet gaettgeetg attactecag catettggaa caatecetga
                                                                      600
ttccccactc cttagaggca agatagggtg gttaagagta gggctggacc acttggagcc
                                                                      660
aggetgetgg etteaaattn tggeteattt acgagetatg ggaeettggg caagtnatet
                                                                      720
teachtetat gggenteath tightetace tgeaaaatgg gggataatsa tagt
                                                                      774
      <210> 48
      <211> 124
      <212> DNA
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tigcaentat anemaigigt cataemital asigticoti asitacagot chacgosact
                                                                      120
tggt
                                                                      124
      <210> 49
      <211> 147
      <212> DNA
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      <221> misc feature
      <222>. (1) ... (147)
      <223> n = A,T,C or G
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tgtggctaca ggtggtgtct gactgcatna aaaanttttt tacgggtgat tgcaaaaatt
                                                                      120
ttagggcacc catateceaa qcantqt
                                                                      147
      <210> 50
      <211> 107
      <212> DWA
      <213> Homo sapien
      <40D> 5D
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atggtttgag gttaggagga gttaggcata tgttttggga gaggggt
                                                                      107
MER D. A. C. 105 51
     <210> 51
      c2115 204
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<212> DNA

## <2135 Homo sapien

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Сдарьедая уарсядавая а	rtgacaccgt	<b>cedadadase</b>	rdecedaread	daggattaad	120
gccttgcaag gtcagaaagg g	gactcaggg	cttccaccac	agccctgccc	cacttggcca	180
ceteettt gggaccagca a	tot	•	<del>.</del>		204
eccectiti gggaccagea a	itgt				
· · · · · · · · · · · · · · · · · · ·	-8				
<210> 52					
<211> 491					
<212> DNA			*.	0.00	
			•		
c213> Homo sapien	1	•	+		
· · · · · · · · · · · · · · · · · · ·	7, ***				
<320>				4	
<221> mise featur	ne.	•		er er er grande i	
<222> (1)(491)		17.1			
					2.0
$\langle 223 \rangle n = A, T, C $	or G	•		*	
				,	
<400> 52			•		
acaaagataa catttatett s	TARCARAR	tttgatagtt	ttaaaggtta	gtattqtgta .	60
gggtattttc caaaagacta a		tesentassa	antranssat	grataaaaca	120
gggcattttc caaaagacta a	iayayacaac	CCBAALBAGE	agecagaaso		
ccatcagaca ggtttttaaa	laacaacata	ttacaaaact	agacaaccac	-CCLTGGGGGGG	res actions
assacttett gtatesattt	ettttgttca	aaatgactga	cttaantatt	tttaaatatt	240
teanaascae tteetesaas	attttcaana	tagtagettt	canatgince	ctcagtccca	300
atgitgitea gataaataaa t	ctestass	acttaccacc	caccacaanc	tttctqqqqc	36D
atgeaacagt gtettttett (	-crostaga	COTTOCTER	ttratagas	accessorest	420
aracaacaac accrerer	coccceec		CCRCRAGGORG	agreed-base	
castittatt tggatascas (	agggteteca	aattatattg	avasatasst	<b>ccasaccas</b> t	480
atcactcttg t			*	* * * * * * * * * * * * * * * * * * * *	491
			1.500		
<210> 53		•			
		*		•	
<211> 484					
			•		
<212> DNA			•		
<213> DNA <213> Homo sapie	n.		•		•
	n.			· · · · · · · · · · · · · · · · · · ·	•
<213> Homo capier	<b>à</b> .				• 
<213> Homo capies		÷ ,,			•
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<213> Homo capies <220> <221> misc_featus <222> (1)(484)	ra )	* .			
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<220> <221> misc_featur <222> (1)(484) <223> n = A,T,C (	ra )	* *			
<213> Homo tapies <220> <221> misc_featus <222> (1)(484) <223> n = A,T,C (	re ) or G	atoxta+b-a	- Frankage to	tatoatotga	60
<213> Homo tapies <220> <221> misc_featus <222> (1)(484) <223> n = A,T,C ( <400> 53  ocataatta grapggdtaa	re ) or G ttaccataag	atgetattta	ttaanaggtn	tatgatetga	60 120
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C ( &lt;400&gt; 53 acataattta gragggdtaa gtattaarag thechgaagt</pre>	ra ) or G ttaccataag ttaccataag	tatgragcat	tetetttttg	ctttgataac	120
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C ( &lt;400&gt; 53 acataattta gragggctaa gtattaacag ttgctgaagt sactacagaac cottaaggac actacagaac actacagaac cottaaggac actacagaac cottaaggac actacagaac cottaaggac actacagaac actacagac cottaaggac actacagac cottaaggac actacagac actacagac cottaaggac actacagac cottaaggac actacagac act</pre>	re ) or G tteccetaeg ttggtettt actgeaeatt	tatgragcat	gttcagaaac	ettigataac attagetget	120 18D
<pre>&lt;213&gt; Homo tapies &lt;220&gt;</pre>	re ) or G tteccetaeg ttggtettt actgaaaatt actatagtaa	tatgragcat agtaagtaaa ttaaaacgtt	tttctttttg gttcagaaac aaaaaaaagt	ettigataac attagetget gttgaaatet	120
<pre>&lt;213&gt; Homo tapies &lt;220&gt;</pre>	re ) or G tteccetaeg ttggtettt actgaaaatt actatagtaa	tatgragcat agtaagtaaa ttaaaacgtt	tttctttttg gttcagaaac aaaaaaaagt	ettigataac attagetget gttgaaatet	120 18D
<pre>&lt;213&gt; Homo tapies &lt;220&gt;</pre>	re ) or G  ttaccetaeg ttggtettt actgaeaatt actategtae	tatgragcat agtaagtaaa ttaaaacgtt anactgottt	gttcagaaac aaaaaaaagt ggaacagaaa	ettigataac attagetget gttgaaatet gggaaaaane	120 18D 240 300
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C ( &lt;400&gt; 53  acataattta gragggctaa gtattaarag tigchgaagt actacagaac critaaggac caatcaaatc totacataac geartagtat anacogetec agetteant tecttagrac</pre>	re ) or G  ttaccetaeg ttggtettt actgeeatt actategtae tgtcaggata tgtcaggata	tatgragcat agtaagtaaa ttaaaacgtt anactgettt aaaggrtgaa	ettettitig gtteagaaae aaaaaaaagt ggaacagaaa tteecttgtt	ettigataac attagetget gttgaaatet gggaaaaane geeteteet	120 1BD 240 300 360
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C ( &lt;400&gt; 53  acataatta gragggetaa grattaarag tigchgaagt actacagaac critaaggac caatcaaatc totacataac geartagtat anacogetec agettigant ticttigige aatqattagc aggtenagta aatqattagc aggtenagta</pre>	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C ( &lt;400&gt; 53  acataatta gragggetaa grattaarag tigchgaagt actacagaac critaaggac caatcaaatc totacataac geartagtat anacogetec agettigant ticttigige aatqattagc aggtenagta aatqattagc aggtenagta</pre>	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A.T.C ( &lt;400&gt; 53 acataattta gcagggdtaa gtattaacag ttgctgaagt sactacagac ccttaaggac caatcaaatc tctacataac goactagtat anacogctcc agcttgant tccttggg aatgattgant ctgtgtattc sactactgant ctgtgtattc</pre>	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C ( &lt;400&gt; 53  acataatta gragggetaa grattaarag tigchgaagt actacagaac critaaggac caatcaaatc totacataac geartagtat anacogetec agettigant ticttigige aatqattagc aggtenagta aatqattagc aggtenagta</pre>	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<213> Homo tapies  <220> <221> misc_featus <222> (1)(484)  <223> n = A.T.C (223)  <400> 53  acataattta gcagggctaa gtattaacag ttgctgaagt sactacagac cottaaggac catcaatt totacataac goactagtat anacogotec agcttgant ttctttgtgc aatgattggc aggtcnggta tancttgant ctgtgtattc cant	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<213> Homo tapies  <220> <221> misc_featus <222> (1)(484)  <223> n = A.T.C (484)  <400> 53  ocataattta gragggetaa gtattaarag tigctgaagt seatcaaate totacataac goartagtat anacogetee gartigant ticttigige aatgattgan etgigattgan etgigatate (486)  <210> 54	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<213> Homo tapies  <220> <221> misc_featus <222> (1)(484)  <223> n = A.T.C (223)  <400> 53  acataattta gcagggctaa gtattaacag ttgctgaagt sactacagac cottaaggac catcaatt totacataac goactagtat anacogotec agcttgant ttctttgtgc aatgattggc aggtcnggta tancttgant ctgtgtattc cant	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<213> Homo tapies  <220> <221> misc_featus <222> (1)(484)  <223> n = A.T.C (484)  <400> 53  ocataattta gragggetaa gtattaarag tigctgaagt seatcaaate totacataac goartagtat anacogetee gartigant ticttigige aatgattgan etgigattgan etgigatate (486)  <210> 54	re ) or G  ttaccetaeg ttggtatttt actgaeaatt actategtae tgtcaggate tgatangagg	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A.T.C ( &lt;400&gt; 53 acataattta geagggetaa gtattaacag ttgetgaagt seatecagae cettaaggae caatecagae tetacatae geactagtat anacegetee agettgant ttetttgtge aatgattgge aggtenggta tancttgant etgtgtatte cant &lt;210&gt; 54 &lt;211&gt; 151 &lt;212&gt; DNA</pre>	re ) or G  tteccetaeg ttggtettt actgeeatt actategtae tgteeggate tgetengege astncceea	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A.T.C ( &lt;400&gt; 53 acataattta gcagggdtaa gtattaacag ttgctgaagt seatcagaac cottaaggac seatcagaac totacataac goactagtat anacogotec agcttgant ttctttgtg satgattggc aggtcnggta tancttgant ctgtgtattc cant &lt;210&gt; 54 &lt;211&gt; 151</pre>	re ) or G  tteccetaeg ttggtettt actgeeatt actategtae tgteeggate tgetengege astncceea	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A.T.C ( &lt;400&gt; 53 acataattta gcagggctaa gtattaacag ttgctgaagt sactacagac cottaaggac scatcaatt totacataac goactagtat anacogotec agcttgant ttctttgtgc aatgattggc aggtcnggta tancttgant ctgtgtattc cant &lt;210&gt; 54 &lt;211&gt; 151 &lt;212&gt; DNA &lt;213&gt; Homo sapies</pre>	re ) or G  tteccetaeg ttggtettt actgeeatt actategtae tgteeggate tgetengege astncceea	tatgragcat agtaagtaaa ttaaaacgtt nnactgettt aaaggrtgaa catattccaa	ettettttg gtteagaaae aaaaaaaagt ggaacagaaa ttacettgtt etcaacactt	attagetget gttgaaatet gggaaaaane geeteteeet etttteeneg	120 180 240 300 360 420 480
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C (484) &lt;210&gt; 53</pre>	re ) or G  tteccetasg ttggtatttt actgaaaatt actatagtaa tgtcaggata tgatangagg astnccaaaa caggancagg	tatgragcat agtaagtaaa ttaaaacgtt anactgettt aaaggrigaa catattecaa eggatggaat	ettettttg gtteagaaae aaaaaagt ggaacagaaa tteeettgtt etesaesett gggeeageee	ettigataac attagetget gtigaaatet gggaaaaane geeteteert ettiteeneg neggatgite	120 18D 240 300 360 420 480 484
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C (484) &lt;210&gt; 53 acataattta gragggetaa gtattaacag tigctgaagt actacagac cottaaggac caatcaaatc totacataac geartagtat anacegetec agettgant tigttgge aatgattgge aggtcnggta tancttgant cigtgtattc (210&gt; 54 &lt;211&gt; 151 &lt;212&gt; DMA &lt;213&gt; Homo gapies &lt;400&gt; 54 actaaacctc gtgettgtaa</pre>	re ) or G  tteccetacy ttggtatttt actgacaatt actatogtac tgtcaygata tgtcaygata tgatangagg astnccaass caggancagg	tatgragcat agtaagtaaa ttaaaacgtt anactgettt aaaggrtgaa catattccaa cggatggaat	tetettttg gtteagaaae aaaaaagt ggaacagaaa ttacettgtt ctcsacsett gggccagccc	attagetget attagetget gttgaaatet gggaaaaane geeteteent etttteeneg neggatgete	120 18D 240 300 360 420 480 484
<pre>&lt;213&gt; Homo tapies &lt;220&gt; &lt;221&gt; misc_featus &lt;222&gt; (1)(484) &lt;223&gt; n = A,T,C (484) &lt;210&gt; 53</pre>	re ) or G  tteccetacy ttggtatttt actgacaatt actatogtac tgtcaygata tgtcaygata tgatangagg astnccaass caggancagg	tatgragcat agtaagtaaa ttaaaacgtt anactgettt aaaggrtgaa catattccaa cggatggaat	tetettttg gtteagaaae aaaaaagt ggaacagaaa ttacettgtt ctcsacsett gggccagccc	attagetget attagetget gttgaaatet gggaaaaane geeteteent etttteeneg neggatgete	120 18D 240 300 360 420 480 484

cctatgccct cccaagegec tittigtitg	Ľ		. *	151
<210> 55	•			
<211> 91		,	•	
c212> DNA				
	•		1	•
<213> Homo sapien	-			
. <400> 55		•		
acctggettg teteegggtg gtteeeggeg	CCCCCCACGG	tecceagaac	guacacttte	60
greetecagt gostactega gecasagtgg			33	91
<210> 56				
<211> 133	•			•
<312> DNA	• • •			· .
<213> Homo mapien	•			
			1	
<400> 56				
ggcggatgtg cgttggttat atacaaatat	gtcattttat	gtaagggact	tgagtatact	. бр
tggatttttg gtatctgtgg gttgggggga	cggtccagga	accaatacce	catogatacc	120
aagggacaac tgt	**			133
:	•	\$ 1	•	
<210> 57				
<211> 147		* * * * * * * * * * * * * * * * * * * *	* *	
<212> DNA		•	•	9
<213> Homo Bapien			•	
•	,			
<220>				
<221> misc_feature	•		•	
<222> (1)(147)				
$\langle 223 \rangle n = A, T, C or G$				
*	*			•
<400> 57				
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gactgggage tgagecette cetttgegee	tgcctcagag	gattgttgcc	gacntgcana	120
totcantggg otggatneat geagggt	;			147
	·	•		
<210> 5B	•	•		
<211> 198				•
<212> DNA	•			
<213> Romo sapien				
				B
<220>				
<221> misc_feature		•	•	
<222> (1)(198)	~ '		•	
<223> n = A,T,C or G		•	•	•
<400> 58				
acagggatat aggtttmaag ttattgtmat				60
tgattacata cattatect ttaaaaaaga				120
atttaccaat gagttacctt gtaaatgaga	agtcatgata	gcactgaatt	ttaactagtt	180
ttgacttcta agtttggt				198
	* * * * * * * * * * * * * * * * * * * *			
<210> 59			*	
<211> 330	The second of the second of	man and the second of	ر ماه منظم المنظم ا المنظم المنظم المنظ	المعرفوني بمارها
<212> DWA			- 1848 -	
<213> Homo sapien		-	*******************************	ار به و در والم

<40D> 59

and the second s			,	
acaacaaatg ggttgtgagg aagtcttatc	agcaaaactg	gigalggcta	ctgazaagat	60
ccattgases ttatcattas tgattttess	tgacaagtta	tcassasctc	actcaatttt	120
caccigigct ageligcias asigggagit	Daggaratage	caaatatagt	atcttctcaa	180
Caecideder waertaeram amidadaar	. pacectages	teranacttt	rcagaaccegg	24 D
tacagtraat aaatgacaaa gccagggcct	acedaraace	1	booycozza	300
cagaaggaat ctattttatc acatggatct	codrecarae	readadesec	CHACGACETE	
Ettegtettt attggaette Ettgaagagt		•		330
				. •
<210> 60			•	*
<211> 175				
<212> DNA				: • • • • • • • • • • • • • • • • • • •
<213> Homo sapien		•	•	
	•		:	
<40D> 60		· .	, A.V., 1	
accetegets cettetacat teetesege	techteacca	acatotogit	ctacttcqqc	60
accordingly correctates receiptows		tactestors	ctttpppcar	120
gtegtggget cettectett catesteate	cagoragogo	ty cock coga		175
tectggaacc ageggtgget gggcaaggee	dyddygtaca	actecedede.	cedac	. 1/3
				v =
<210> 61				
<211> 154				***
			. 7	
<212> DNA	· .			•
<213> Homo sapien				
Control of the mediate eminimization and the control of the contro	tames resistant resistant in the	teat in it is more than the teather	el a se e <del>ntrata</del> ción de la constante de la co	en de la la
<400> 61				
accepantth technology agoagtotes	actteteact	getacatgat	gagggtgagt	. 60
ggttgttgct cttcsacagt atcctccct	ttcccccatct	actasaccaa	acagcagtgc	120
terrates announced stages the	rtat	<del>-</del>		154
tggaetgeac agecccgggg ctecacattg	OCAL.			
	*			
<210> €2			•	
<211> 3D		•		
<212> DNA		4 , 1 (V)		
c213> Homo sapien				
		•	•	
<400> 62				30
cgetegagee etatagtgag tegtattaga				
				- 4
<210> 63			•	
<211> 89	" •	•		- 8
<212> DNA	*			•
<213> Homo sapien			*	
	. *	•		
<400> 63				
acaagteatt teageacect ttgetettea	aaactgacca	tettttatat	ttaatgette	60
rtgtatgast sassatggtt atgtcaagt		We ge		8.9
	•	*		
27105 E4	*			
<210> 64	· · · · · ·	- · · · · · · · · · · · · · · · · · · ·	0	
<211> 97	•	. *		
<212> DNA				
<213> Homo sapien	,			*
•				
<400> <b>54</b>	•	,		
~~UUV> 04		aataaataaa	anttetaeea	. 60
accggagtaa ctgagtcggg acgctgaatc	gaarccacc	antanntann	AArrockond	97
aatcagtgca tocaggattg gtoottggat	ctggggt	•		37
			*	
<210> 65				
2.5 -6-7 <b>c2115 377</b> 75 77 75 75 75 75 75	* . · · · · .	0 00		
<212> DNA				سيباسخ رياه ديهم بقيه وبالدب

```
<220>
      <221> misc feature
      <222> (1)...(377)
     <223> n=A,T,C or G
      <40D> 65
acaacaanaa ntecettett taggeeactg atggaaaeet ggaaceeeet tttgatggea
                                                                         €D
gcatggogte ctaggeettg acacagogge tggggtttgg getnteecaa acegeacaee
                                                                        120
ecaaceetgg betaceeaca nttetggeta tgggetgtet etgecactga acateagggt
                                                                        180
toggtoataa natgaaaboo caanggggad agaggtoagt agaggaagot caatgagaaa
                                                                        240
ggtgctgttt gctcagccag aaaacagctg cctggcattr gccgctgaac tatgaacccg
                                                                        300
tgggggtgaa ctacccccan gaggaatcat gcctgggcga tgcaanggtg ccaacaggag
                                                                        360
gggcgggagg agcatgt
                                                                        377
      <210> 66
      <211> 305
      <212> DNA
      <213 > Homo sapies
     .<400> 66
acycotttcc ctcagaatte agggaagaga ctgtogcctg ccttcctcog ttgttgcgtg
                                                                         6 D
agaacccgtg tgccccttcc caccatatcc accctcgctc catctttgaa ctcaaacacg
                                                                        120
aggaactaac tgcaccetgg teststesse agtosssagt tsacestesa tssetsacet
                                                                        180
tectocacto taagggatat caacactgee cageacaggg greetgaatt tatgtggttt
                                                                        24 D
ttatatattt tttaataaga tgeactttat gteattttt aataaagtet gaagaattae
                                                                        30D
tgttt -
                                                                        305
      <210> 57
      <211> 385
      <212> DNA
      <213> Homo sapien
      <4DD> 67
actacacaca ctecactige cettgtgaga cactitgtee cageactita ggaatgetga
                                                                        60
ggtcggacca gccacatctc atgtgcaaga ttgcccagca gacatcaggt ctgagagttc
                                                                       120 .
contitions analogyment typitamana agangtotag concentift giagagongo
                                                                       180
tgtgctgtgc tggagattca cttttgagag agttctcctc tgagacctga tctttagagg
                                                                       240
ctgggcagtc ttgcacatga gatggggctg gtctgatctc agcactcctt agtctgcttg
                                                                       30D
cototoccag ggccccagec tggccacacc tgcttacagg gcactotcag atgcccatac
                                                                       36D
catagittet gigetagigg accet
                                                                       385
      <210> 68
     <211> 73
      <212> DNA
      <213> Homo gagien
      <400> 6B
acttaaccag atatatetti accecagatg gggatattet tigtaaaaaa igaaaataaa
                                                                        60
gtttttttaa tgg
                                                                        73
     c210> 69
      <211> 536
      <212> DNA
      <213> Homo sapien
      <220>
     <221> misc_feature
```

<222> (1) ... (536)

```
<223> n = A,T,C or G
```

```
<400> 69
actagtoras tgtggtggaa ttocattgtg ttgggggctc tcaccctcct ctcctgcagc
                                                                        สก
tecagetttg tgetetgeet etgaggagae catggeecag eatetgagta ecetgetget
                                                                       120
                                                                       180
cotgotggcc accotagety typocotyge ctggagecee aaggaggagg ataggataat
cocgggtggc atotataacg cagacetesa tgatgagtgg gtacagcgtg cccttcactt
                                                                       24 D
ogccatcago gagtetasca aggccaccaa agatgactae tacagacgto cyctgogggt
                                                                       300
actaagagcc aggcaacaga ccgttggggg ggtgaattac ttottcgacg tagaggtggg
                                                                       360
cogaaccata tgtaccaagt cocageccaa ettggacace tgtgeettee atgaacagee
                                                                       420
agazetgeag aagaaaeagt tgtgetettt egagatetae gaagtteeet ggggagaaea
                                                                       48Q
gaangtooot gggtgaaato caggtgtcaa gaaateetan ggatetgttg cragge
                                                                       536
      <210> 70°
      <211> 477
      <212> DNA
      <213> Homo sapien
     <40D> 78
atgaceceta acappegece teteagecet cetaatgace teeggeetag coatgigati
                                                                        60
tractturar tocataarge tectratact aggectacta accascacac taaccatata
                                                                        120
creatgatgg_cgcgatgtma_cacgagmmag_cacataccam_ggccaccaccacacctgt
                                                                       180
ccaaaaagge cttcgatacg ggataatcct atttattacc tcagaagttt ttttcttcgc
                                                                       240
agggattitt etgageettt taccaeteex geetageeee tacceeeexa etaggaggge
                                                                       300
actggcoccc sacaggcate accoccetas atrecetaga agteceacte etasacacat
                                                                       36D
cogtattact ogcatcagga gtatcaatca octgagotca coatagtota atagaaaaca
                                                                        42D
acogaaacca aattattcaa agcactgctt attacaattt tactgggtct ctatttt
                                                                       477
      <210> 71
      <211> 533
      c212> DNA
      <213> Homo sapien
      <220>
      c221> misc_feature
      <222> (1) ... (533)
     <223> n = A, T, C or G
      <400> 71
agagetatag gtacagtgtg atotoagett tgcaaacaca ttttctacat agatagtact
                                                                         6 D
aggtattaat agatatgtaa agaaagaaat cacaccatta ataatggtaa gattggttta
                                                                        120
tgtgatttta gtggtatttt tggcaccett atatatgttt tecaaacttt cagcagtgat
                                                                        180
attatttoca taacttaasa agigagiitg aassagssas iciccagesa gcaleicali
                                                                        240
taaataaagg Ettgtcatct ttaaaaatac agcaatatgt gactttttaa aaaagctgtc
                                                                        300
anataggigi gaccotacta ataattatta gaaatacatt taxaaacatc gagtaccica
                                                                        360
agreageting certigaaaaa tateaaatan aactettaga gaaatgtaca taxaagaatg
                                                                        420
ettegtaatt tiggagtang aggitteette ettaattitig tattittaaa aagtacatgg
                                                                        480
taaaaaaaaa aattoacaac agtatataag getgtaaaat gaagaattet gee
                                                                        533
      <210> 72
      <211> 511
      <212> DNA
      <213> Homo sapien
```

<220×

<221> misc_feature <222> {1}...{511} <223> n = A,T,C or G

```
<400> 72
 tattacggaa aaacacacca cataattcaa ctancaaaga anactgotto agggogtgta
                                                                         60
 aaatgaaagg cttccaggca gttatctgat taaagaacac taaaagaggg acaaggctaa
                                                                        120
 aagoogcagg atgtotacac tatancaggo gotatttggg ttggctggag gagotgtgga
                                                                        180
 aaacatggan agattggtgc tgganatcgc cgtggctatt cctcattgtt attacanagt
                                                                        24D
gaggttetet gtgtgeeeac tggtttgaaa accgttetme aataatgata gaatagtaca
                                                                        300
cacatgagaa ctgaaatggc ccaaacccag aaagaaagcc caactagatc ctcagaanac
                                                                        36D
gettetaggg acaataaccg atgaagaasa gatggeetee tégtgeecce gtetgttatg
                                                                        420
attitototoc attgcagena naaaccogti citetaagea aacneaggig atgatggena
                                                                        490
Asstacacce ectettgaag nacenggagg a
                                                                        511
      <210> 73
      <211> 499
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> [1] ... [499]
      <223> n = A,T,C or G
      <400> 73
cagtoctage actogrees gractagest coareages grounting grounds
                                                                         60
cagiggigge ticagigety gigerageet gacegoeact cleacatity ggetettege
                                                                        120
tggccttggt ggagctggtg ccagcaccag tggcagctct ggtgcctgtg gtttctccta
                                                                        180
casgigagat titagatati gitaatootg coagictite tetteaagee agggigeate
                                                                        240
ctragaaaco tartcaacar ageactriag gragoracta traatcaatt gaagttgara
                                                                        300
ctotycatta aatotattty coatttotya assaassaasa saassaaggy oggoogotog
                                                                        360
antitagagg goocgittes acceptigat ragretrgat totoretet antigerage
                                                                        420
catetgttgt tigeccetec cocgnigect tectigacor tggaaagtgc cacteccact
                                                                        480
gtcctttcct aantaaaat
                                                                        499
      c210> 74
      <211> 537
      <212> DNA
      <213> Homo sapiem
      <220>
      <221> misc_feature
      <222> (1) ... (537)
      <223> n = A,T,C or G
      <400> 74
tttcatagga gaacacactg aggagatact tgaagaattt ggattcagcc gcgaagagat
                                                                        60
ttatcagett aacteagata aaateattga aagtaataag gtaaaageta gtetetaact
                                                                       120
tccaggccca cggctcaegt gaatttgaat actgcattla cagtgtagag taacacataa
                                                                       190
cattgtatgc atggasacat ggaggsacag tattscagtg tcctaccact ctsatcaaqa
                                                                       240
amagmatter agactitget totacagiga igatigaati ciaaaaatgg taatcattag
                                                                       300
ggcttttgat ttataanact tigggtactt atactaaatt atggtagtta tactgccttc
                                                                       360
cagtitigett gatatatitig tigatattaa gattettgae tiatatitig aatgggttet
                                                                       420
actgaaaaan gaatgatata tictigaaga catogatata catitatita cacteligat
                                                                       480
totacaatgt agaaaatgaa ggaaatgooc caaattgtat ggtgataaaa gtoocgt
                                                                       537
    <21D> 75
    ~ <211> 467
 ..... <212> DNA .....
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<213> Homo sapien

```
<220>
       <221> misc_feature
       <222> (1) ... (467)
       <223> n = A,T,C or G
       <400> 75
casenacest tottcsammag atgrassigs tacactacts etgeagetes essaeseete
                                                                         60
tgcatattam segtacetem tectgetect caagtagtgt ggtetatttt gemateatea
                                                                        120
ectgetgtet gettagaaga acggetttet getgeaangg agagaaatea taacagaegg
                                                                        180
 tegenerage aggreatett tteeteateg ettattetee etagaagest etteteagga
                                                                        240
totagttggg ctttctttct gggtttgggc catttcantt ctcatgtgtg tactattcta
                                                                        300
tcattattgt atmacggttt tcamecongt gggcacncag agascotcac tctgtmatam
                                                                        360
castgaggas tagccacqqt gatctccagc accasatctc tccatqttnt tccaqagctc
                                                                        420
ctocagocaa cccaaatago ogotgotatn gtgtagaaca tecetgo
                                                                        457
       <210> 76
       <211> 4D0
       <212> DNA
       <213> Homo sapien
       <22D>
       <221> misc feature
       <232> (1)...(400) -
       c223> n = A,T,C or G
       <400> 76
 aagotgarag cattogggee gagatgtete geteegtgge ettagetgtg etegegetae
                                                                         60
tetetette tggeetggag getatecage gtaetecaaa gatteaggtt taeteaegte
                                                                       120
atccagcaga gaatggaaag tcaaatttec tgaattgcta tgtgtctggg tttcatccat
                                                                        180
cogacattya agttgactta ctgaagaatg gagagagaat tgaaaaagtg gagcattcag
                                                                        240
                                                                        3 D O
 actigiciti cagcaaggac iggictitci alcictigia ciacacigaa itcacccca
                                                                        360
 ctgaaaaaga tgagtatgcc tgccgtgtga accatgtgac tttgtcacag cccaagatng
                                                                        400
 ttnagtggga toganacatg taagcagcan catgggaggt
       <210× 77
       <211> 248
       <212> DNA
       <213 > Homo sapien
       <4D0> 77
 etggagtgee ttggtgttte aageecetge aggaageaga atgeacette tgaggeacet
                                                                         БÔ
                                                                        120
 ccagetgeec cogeogogya tgegaggete ggageaceet tgeccggctg Cgattgetge
                                                                        1B0
 raggeartgt teatstrage tittetgire efficience ggesageget tetgetgass
gttcatatct ggagcctgat gtcttaacga ataaaggtcc catgctccac ccgaaaaaaa
                                                                        240
                                                                        24B
asasaaa
       <210> 78
       c2115 201
       <212> DNA
       <213> Homo sapien
       <4Q0> 78
actagiccas igiggiggaa ticcatigig tigggoccaa cacaatggot accittaaca
                                                                         60
tcacccagac cocgecctge cogtgeecea egetgetget aacgacagta tgatgettac
                                                                        120
tetgetacte ggaaactatt tttatgtaat taatgtatge tttcttgttt ataaatgeet
                                                                        380
gatttaaaaa aaasaaaaaa a
```

```
<210> 79
       <211> 552
       <212> DNA
       <213> Bomo sapien
       <230> 1
       <221> misc_feature
       <222> (1)...(552)
       <223> n = A, T, C or G
       <400> 79
 tecttttgtt aggittttga gacaaceeta gacetaaact gtgteacaga ettetgaatg
                                                                         60
 tttaggcagt gotagtaatt teetegtaat gattetgtta ttacttteet attettatt
                                                                        120
 cetetteett etgaagatta atgaagttga aaattgaggt ggataaatae aaaaaggtag
                                                                        180
 tgtgatagta teagtatota agtgcagatg seagtgtgtt atatetstoc attcaaaett
                                                                        24 D
 atgraagtta gtaattactc agggttaact aaattacttt aatatgctgt tgaacctact
                                                                        3 Q D
 ctgttccttg gctagaaaaa attataaaca ggactttgtt agtttgggaa gccaaattga
                                                                        360
 taatattota tyttotaaaa yttyyyotat acataaanta tnaagaaata tyyaattita
                                                                        420
 tteeraggaa tatggggtte atttatgaat antaceeggg anagaagttt tgantmaaac
                                                                        480
 engtitiggi taataegita ataigieetn aainaacaag genigaetta titeeaaaaa
                                                                        540
 aasaaaaaa as
                                                                        552
       <210> 80
       <211> 476
       <212> DNA
       c213> Homo gapien
      <220>
      <221> misc_feature
      <222> (1)...(476)
      \langle 223 \rangle n = A,T,C or G
      <400> BO
acagggattt gagatgctaa ggccccagag atcgtttgat ccaaccctct tattttcaga
3993aaaatg gggcctagaa gttacagage atctagetgg tgcgctggca cccctggcct
cacacagact coogagtage toggactaca ogcacacagt cantoaagca ogcoctottt
genaticacy tigecacete enactioned atteticate igigatgice tragicacia
                                                                        240
aggitaaact ticccaccca gamaaggcam citagatmaa aicttagagt actitcatac
                                                                        300
tettetaagt cetetteeag ecteaettig agtecteett gggggttgat aggaaninte
                                                                        36Q
tottggettt ctcaataaaa tetetateea teteatgttt aatttggtae gentaaaaat
                                                                        420
gctgaaaaa ttaaaatgtt ctggtttcnc tttaaaaaaa aaaaaaaa aaaaaa
      <210> B1
      <211> 232
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(232)
      <223> n = A,T,C or G
      <400> B1
tttttttttg tatgeenten etgtggngtt attgttgetg ecaceetgga ggageecagt
ttettetgta tetttettt etgggggate tteetggete tgeeesteea tteecagest
                                                                      120
cteatecors tettgeactt ttgetaggst tggaggeget tteetggtag ecceteagag
acteagteag egggaataag teetaggggt ggggggtgtg geaageegge et
                                                                       232
```

```
c210> 82
     c211> 383
      c212> DNA
     c2135 Homo sapien
     <220>
      <221> misc_feature
      <222> (1) ... (383)
      <223 n = A,T,C or G
      <400> 82
aggogggago agaagotaaa gocaaagoco aagaagagta goagtgocaa caetgatgoc
agtaccagta ccaataacat gccagtgcca gtgccagcac cagtggtggc ttcagtgctg
                                                                       120
                                                                       180
gtgerageet gacegecact ctoacatttg ggetettege tggeettggt ggagetggtg
ccagcaccag tggcagetet ggtgcctgtg gttteteeta caagtgagat tttagatatt
                                                                       241
gttaatectg coaptettte tetteaagee agggtgeate etcagaaace tacteaacac
                                                                       300
ageactetng geagecacta tematematt gamgttgaca etetgeatta matetatttg
                                                                       360
                                                                       383
ccatttcaas aassassas asa
      <210> 83
      <211> 494
<212> DNA
      <213> Homo Bapien
      c220>
      <221> misc feature
      <222> (1) ... (494)
      c2235 n = A, T, C or G
      <400> 83
                                                                        60
accesanting gacogotype ttataagoga teatgiocic cagtattaco teaacgagoa
gggagatega gtotataego tgaagaaatt tgaecogatg ggacaacaga cetgetcage
                                                                        120
ccatectget egyttetece cagatgacaa atactetega cacegaatea ecateaagaa
                                                                        180
acgetteaag gigeteaiga eccageaace gegeeeigte eteigagggi ceitaaacig
                                                                        240
atgictitte teccacetet tacccetege agarteegta accasactet toggartete
                                                                        300
agreetgatg cettitigee agreatacte titiggenice agteteigt ggegatigat
                                                                        36D
tatgettgtg tgaggeaate atggtggeat cacceatnaa gggaacaeat ttganttttt
                                                                        42D
tttoncatat tttaaattac naccagaata nttoagaata aatgaattga aaaactotta
                                                                        480
                                                                        494
8888 88688 BBB
      <210> 84
      <211> 38D
      <212> DNA
      c213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(380)
      <223> n = A,T,C or G
      <400> 84
gctggtagce tatggcgtgg coacggangg gctcctgagg cacgggacag tgacttccca
                                                                        . ED
agtatectge geogestett ctacesteec tacetscaga tettesses gattecccag
                                                                        12D
gaggacatgg acgtqgccct catggagcac agcaactgct cgtcggagcc cggcttctgg
                                                                        18D
geacacecte etggggecea ggegggeace tgegtetece agtatgecaa etggetggtg
                                                                        240
gtgctgetec tegtestett cetgetegtg gccasestee tgctggtese ttgetesttg-
                                                                        300
ccatgiticag tracacatte ggcasagtae agggeascag cnatetetae igggaaggee
                                                                        360
                                                                        380
agestinees ecteateess
```

```
<210> 85
       <211> 481
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (481)
       \langle 223 \rangle n = A, T, C or G
       <400> 85
gagttagete etecaçasee ttgatgaggt egtetgeagt ggeetetege tteatacege
                                                                          60
tnccategic atactgragg titgccacca cotectgrat cttggggggg ctaatatora
                                                                         120
ggazactetc aatcaagtca cegicnatna aacetgigge iggitetgic iteegetegg
                                                                         180
tytsaaasga totocagaag gagtgotoga tottocccac actittgatg actitattga
                                                                         240
stemattety catatecase aggagattat accasetete teacasteas etcaccasee
                                                                         300
ctatcatger nttgaacgtg ccgaagaaca cogageettg tgtggggggt gnagteteac
                                                                         360
coagattotg cattaccaga nageogtggo aaaaganatt gacaactogo coaggnngaa
                                                                         420
aaagaacacc teetggaagt getngeeget eetegteent tggtggnnge gentneettt
                                                                         480
                                                                         481
       <210> 86
      <211> 472
       <212> DNA
       <213> Homo Bapien
      <220>
      <221> misc_feature
       <222> (1)...(472)
       <223> n = A,T,C or G
      <400> 86
ascatettee tgtataatge tgtgtaatat egateegatn ttgtetgetg agaatteatt
                                                                         50
actigganes greattines gertggerer toglettess ettrereste tgreerectt
                                                                         120
tasacagigi gicaatcigo toocttacti igicatcaco agiciggaa taagggiaíg
                                                                        180
coctatteac acctgitaaa agggegetaa geattittga ticaacatet tittittiga
                                                                        24 D
cacaagtoog aaaaaagcaa aagtaaacag ttottaattt gttagccaat teactttett
                                                                        300
catgggaceg agccattiga ttlasseegc eastigcels atsitgegot tigggegotg
                                                                        360
atainigage ggaagantag cettictact teaceagaca caactectit cataiiggga
                                                                        42D
tgttnacnaa agttatgtct cttacagatg ggatgetttt gtggcaatte tg
                                                                        477
      <210> 87
      413 م211s
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(413)
      <223> n = A,T,C or G
      <400> 87
agazaccagt atototnama acaacctoto atacottgtg gacctmattt tgtgtgcgtg
                                                                         60
totototoro cocatattat ategacegge acatettttt taettttota maagettato
                                                                        120
ectettiggt atctatatet gigasagitt tasigatetg cestasigie tiggggacet
                                                                        180
ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagttngt
                                                                        24
tttattogae atgaaggaaa tttocagatn acaacactna caaactotoc ottgactagg
```

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ggggacsaag aaaagcamaa ctgaacatma gaaacaatto cctggtgaga aattocataa
                                                                        360
acagaaatto ogtootatat tgaaananng catcatinea acgttititt tit
                                                                        413
       <210> 88
       <211> 448
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) ... [448]
       <223> n = A,T,C or G
       c400> 88
rgcageggt cotetotato tagetocage otetogooty coccaetoco egegtocoge
gtoctageen accatggoog ggeocetgeg egeceegetg etestgeteg ceatestage
                                                                        120
ogtogocoto googtgagen engeggeegg et ceagtere ggeaagerge egegentegt
                                                                        180
gggaggecca tggaccccgc gtggaagaag aaggtgtgcg gcgtgcactg gactttgccg
                                                                        240
teggenanta caacaaacce geaxenactt ttacenagen egegetgeag gtegtgeege
                                                                        300
cccaancaaa ttgttactng gggtaantaa ttettggaag ttgaacetgg gecaaacmig
                                                                        360
tttaccagaa conagocaat ingaacaati necoctocat aacagococt titaaaaaagg
                                                                        420
gaancantco tontotttto casatttt
                                                                        448
      <210> 89
      <211> 463
       <212> DNA
       <213> Homo sapien
       <220×
      <221> misc_feature
      <222> (1)...(463)
      <223> n = A, T, C or G
      <400> 89
gaattttigtg cactggccac tgtgatggaa ceattgggcc aggatgcttt gagtttatca
glagigatic igccaaagti ggigligtaa caigagtaig taaaaigtca aaaaattagc
                                                                       120
agaggictag gictgcatat cagcagacag titgicogig tattitgtag cottgaagti
                                                                       180
otcagegaca agtinntict gatgegaagt tetnaticea gtgitttagt cetttgeate
                                                                       240
tttnatgttn agasttgsst stolmaeatt getttigtni tstgsaggta statsigtgg
                                                                       300
ttteaceasa tagaannact tetetgettn gaanatttga atatettaca tetmaasatm
                                                                       360
asticiotes ecatannaaa acceangese tiggganaat tigaaaaang gnicettenn
                                                                        420
aattennana antteagntn teataceaca naacnggane ccc
                                                                        463
      <210> 90
      <211> 40D
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(400)
      <223> n = A,T,C or G
   ·· <400> 90
agggattgaa ggtotnitni actgtoggac tgttcancca ccaactotac aagttgctgt
                                                                       60
ottoractea etgicigiaa genintiaac ecagactota tetteataaa tagaacaaat
                                                                       120
tetteaceag teacatette taggacettt tiggatteag ttagtataag etetteeact
                                                                       180
tecttighta agaetteate tggtamagte ttmagttitg tagaamggam titmattget
                                                                       240
```

S. Dankerskiller

```
egitetetas cantytoric teetigaagi attiggeiga acaacceace inaagireet
                                                                        300
 ttgtgcatcc attttaaata tacttaatag ggcattggtn cactaggtta aactctgcaa
                                                                        360
 gagteatetg tetgemaaag ttgogttagt atatetgeea
                                                                         400
       <210> 91
       <211> 480
       <212> DNA
       <213> Homo sapien
      <220>
       <221> mico_feature
       <222> (1)...(480)
      \langle 223 \rangle n = A,T,C or G
      <400> 91
gageteggat ccaataatet tigietgagg geageacaea taincagige caiggnaaci
                                                                         60
ggtctacccc acatgggagc agcatgccgt agntatataa ggtcattccc tgagtcagac
                                                                        120
atgretettt gaetaeogtg tgecagtget ggtgattete acacacetee nneegetett
                                                                        180
tytyyaaaaa ctyycactty netyyaacta geaagacate aettacaaat teacecacya
                                                                        240
gacartigas aggigiasca sagegariet igratigrit titgicecte eggeacesgi
                                                                        300
tgtcmatact aaccegetgg tttgcctcca tcacatttgt gatctgtagc tctggataca
                                                                        360
tetretgaca gracigaaga actiettett tigitteaaa ageaacteti ggigeetgit
                                                                        420
ngatcaggit cccatttccc agtecgaatg ttcacatggc atainttact tcccacaaaa
                                                                        480
      <210> 92
      <211> 477
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(477)
      <223> n = A,T,C or G
      <400> 92
atacagueca natecuacua ugaagatgug ettyttyaet gagaacetga tycyyteaet
                                                                         60
ggtorogetg tagococago gactotocae otgotogaag eggttgatge tgcactectt
                                                                        120
eccaegeagg cageageggg geeggteaat gaacteeaet egtggettgg ggttgaeggt
                                                                        180
taantgcagg aagaggotga ocacotogog gtocacoagg atgooogaot gtgogggaco
                                                                        240
tgcagogaaa ctcctogatg gtcatgagog ggaagcgaat gangcccagg gccttgccca
                                                                        300
gaacetteeg cetattetet ggegteacet geogetgetg cegetnacae teggeetegg
                                                                        36Q
accagoges asacogoott gaacagoogo acctoacoga tocccantot otcococtoc
                                                                       420
aggaacggcn ccagcgtgtc caggtcaatg teggtgaanc ctecgogggt aatggog
                                                                        477
      <210> 93
      <2115 377
      <212> DWA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) . . . (377)
      <223> n - A,T,C or G
      c400> 93
gaarggetgg acettgeete geattgtget getggeagga atacettgge aageagetee
agtocgagea geoccagace getgeegeee gaagetaage etgeetetgg cetteeeete
egerteaatg tagaaccant agtgggagea ctgtgtttag agttaagagt gaacactgtm
```

```
tgattitact tgggaattte etetgttata tagettttee caatgetaat ttecaaacaa
                                                                         240
caacaacaaa ataacatgtt tyeetgttna gttgtataaa agtangtgat tetgtatnta
                                                                         300
adpossatet tactyttaca tatactyctt gcaanticty tatttettyy thetetygaa
                                                                         360
atabatatat tattees
                                                                         377
      <210> 94
      <211> 495
      <212> DNA
      <213> Homo capien
      <220>
      <221> misc_feature
      <222> (1)...(495)
      <223> n = A,T,C or G
      <4D0> 94
ccetttgagg ggttagggte cagtteccag tggaagaad aggecaggag aantgegtge
                                                                          60
chargetraing carattteer araptracer caragreets gretatarte tetraceret
                                                                         120
cceaggaing accepttet ggggaentgg getggnggge nggneetagn ggenecangg
                                                                         18D
gaaggeeeca tteogggget gtteeecgag gaggaaggga aggggetetg tgtgeeecec
                                                                         240
acgaggaana ggccctgant cctgggatca nacacccctt cacgtgtatc cccacacaaa
                                                                        300
tgcaagetea ccaageteee eteteagtee etteeetaca eentgaargg neartegene
                                                                        360
acacccarce agancancea eregreatgg ggaatgtnet caaggaateg engggeaacg
                                                                        420
tggactctng tcccnnaagg gggcagaatc tccaatagan gganngaacc cttgctnana
                                                                        480
ARARE STREEFERS
                                                                        495
      <210> 95
      <211> 472
      c212> DNA
      <213> Homo sapien
      €220>
      <221> misc feature
      <222> (1) ... (472)
      \langle 223 \rangle n = A,T,C or G
      <400> 95
ggttacttgg tttcattgcc accacttagt ggatgtcatt tagaaccatt ttgtctgctc
                                                                         60
cototggaag cottgogcag agoggacttt gtaattgttg gagaataact gotgaatttt
                                                                        130
tagetytttt gagttgatte gesesstge accaeste aatstgaasa etattmaet
                                                                        190
tetttattat cttgtgmena gtatacaatg aaaattttgt tcatactgta tttatcaagt
                                                                        240
atgatgaaaa gcaatagata tatattotti tattatgitn aattatgatt gccattatta
                                                                        300
atoggoaaaa tgtggagtgt atgttotttt cacagtaata tatgcotttt gtaacttoac
                                                                        360
ttggttattt tattgtaast gaattacass attcttaatt taagassatg gtangttats
                                                                        420
tttanttcan taatttettt cettgtttae gttaattttg aaaagaatge at
                                                                        472
      <210> 96
      <211> 476
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1)...(476)
      \langle 223 \rangle n = A,T,C or G
```

cigaagcatt toticaaact intotactit igtoatigat accigiagia agiigacaat

c400> 96

```
giggigaaat ticaaaatta talgiaacti etaetagitt tacittetee cccaagicti
                                                                         150
 ttttaactca tgatttttac acecaceetc cagaacttat tatatageet ctaagtettt
                                                                         180
 attettemea gragargarg sasgagreet cragtgreet gngcanastg treragntat
                                                                         240
 agotggatac atecngtggg agttotataa actoatacot cagtgggact naaccaeaat
                                                                         300
 tgtgttagte teaatteeta ecacactgag ggageeteec aaatcactat attettatet
                                                                         360
 quaggtacte etccagaaaa acngacaggg caggettgca tgaaaaagtn acatetgogt
                                                                         420
 tacaaagtot atottootoa nangtototh aaggaacaat ttaatottot agetet
                                                                         476
       <210> 97
       c211> 479
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> {1| ... [479]
      <223> \pi = A_1T_1C or G_1
       <400> 97
actottteta atgetgatat gatottgagt ataagaatge atatgtenet agaatggata
aaataatgot geaaacttaa tyftettaty caaaatyyaa cyctaatyaa acacayotta
                                                                        120
castogcass beassactes casgigetes tetgitging stitinging ataseactis
                                                                        180
gatigigete etteggatat gatigittet canatetigg geaainttee tiagicaaat
                                                                        240
caggotacta gasttotgtt attggatatn tgagagoatg aaatttttaa naatacactt
                                                                        300
StSattatna sattastese assittemet tatacetget aleageaget agassacat
                                                                        360
ntmnttttta netcaeegta ttttgtgttt ggaantgtnn aaatgaaatc tgaatgtggg
                                                                        420
ttonatotta ttitttocon gachactant incittitta gggnotatto tganocato
       <210> 98
       <211> 461
       <212> DNA
       <213 > Homo gapien
      <400> 98
aptgacttpt cotcoascas ascoccttgs tosspttigt ggcsctgscs atcagaccts
                                                                         60
tgctagttcc tgtcatctat tcgctactaa atgcagactg gaggggacca aaaaggggca
                                                                        120
toaactocag ciggattatt tiggagootg caaatctatt cotactigta cggacttiga
                                                                        180
agigaticag ittectetae ggatgagaga eiggetemag aatateetea igeagetita
                                                                        240
tgaagccact ctgaacacgc tggttatcta gatgagaaca gagaaataaa gtcagaaaat
                                                                        300
ttacctggag asaagagget ttggctgggg accateceat tgaacettet ettaaggaet
                                                                        360
ttaagaaaaa ctaccacatg ttgtgtatec tggtgcogge cgtttatgaa ctgaccaecc
                                                                        420
tttggaataa tettgaeget eetgaacttg etectetgeg a
                                                                        451
      <210> 99
      <211> 171
      <212> DNA
      <213> Homo sapien
      <400> 99
stageogede desadatatt condraced cadadecce receptoced sadadeccer
                                                                        60
eggegeetet gegggeeega ggaggagegg etggegggtg ggggggagtgt gaeeeaceet
                                                                       120
cggtgagaam agcottotot agcgatotga gaggogtgoo ttgggggtao o
                                                                       171
      <210> 100
      <211> 269
      <212> DNA
      <213° Homo sapien
```

<212> DNA

<213> Homo sapiem

```
<400> 100
cggccgcaag tgcaactcca gctggggccg tgcggacgaa gattetgcca gcagttggtc
                                                                     60
                                                                    120
cgactgogac gacggoggog gogacagtog caggtgoago gogggogoot ggggtottgo
                                                                    180
azggotgago tgaogoogoa gaggtogtgt cacgtocoac gadottgaog cogtogggga
                                                                    240
cadoceddwae wawdeccedat dwwdeaddwa dectedada deceetedda wwaaddeadae
                                                                    269
cgagagatac gcaggtgcag gtggccgcc
      <210> 101
      <211> 405
      <212> DNA
      c2135 Homo sapien
     <4005 1D1.
tttttttttt ttttggaate tactgegage acageaggte ageaacaagt ttattbtgca
                                                                     60
getageaagg taacagggta gggcatggtt acatgttcag gtcaacttcc titgtcgtgg
                                                                    120
tegettggtt tgtctttatg ggggcggggt ggggtagggg aaacgaagca aataacatgg
agtgggtgea cectecetgt agaacetggt tacaaagett ggggeagtte acctggtetg
                                                                    24 D
tgaccqtcat tttettgaca tcaatgttat tagaagtcag gatatetttt agagagteca
                                                                    300
ctgttctgga gggagattag ggtttcttgc caaatccaac aaaatccact gaaaaagttg
                                                                    360
                                                                    405
gatgatcegt acgestaccy aggretattc tcatatcggt ggcca
    <310> 103
      <211> 470
      <212> DNA
      <213> Komo sapien
      <400> 102
ggracttaat coattettat ticaaaatgt ctacaaatti aateccatta tacggtatti
tesasateta aattattesa attagecasa teettaecas atsataeera assatesasas
                                                                     180
atatactict ticagemmas tigitacata aattaamaa atatataegg eiggigtitt
                                                                     24D
caaagtacaa ttatottaac actgomaaca ttttaaggaa otaaaataaa maamaacmot
                                                                     30D
                                                                     360
cogcanaggi taaagggaac aacaaattot titacaacad cattataaaa atcatatoto
anatettagg ggastetate ettesesegg getettaset titseteset tigtitatit
                                                                     420
ttttaaacca ttgtttgggc ccaacacaat ggaatccccc ctggactagt
      <210> 103
      <211> 581
      c212> DNA
      <213> Homo mapien
      <400> 103
tttttttttt tttttttga occocctctt ataaaaaaca agttaccatt ttattttact
                                                                     60
                                                                     120
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BEST TARABAS CONTROL TO THE STATE OF THE STA		##AAA CCC EGE	******	222	Acche contra	desagonos de	tatagtagas	3300
		redradadara	attrottet.	tatttanaa	macter renda	2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-	BRAGARAGA	3360
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200 His Phe Arg Val Tyr Leu Ser Lys Glu Ala Glu Arg Lys Leu Leu Thr 220 215 Trp Glu Ser Val His Lys Glu Asn Phe Leu Leu Ala Arg Ala Arg Asp 235 230 . Lys Arg Glu Ser Asp Ser Glu Arg Leu Lys Arg Thr Ser Gln Lyc Val 245 Asp Leu Ala Leu Lys Gln Leu Gly His Ile Arg Glu Tyr Glu Gln Arg 265 Leu Lys Val Leu Glu Arg Glu Val Gln Gln Cys Ser Arg Val Leu Gly 580 Trp Val Ala Glu Ala Leu Ser Arg Ser Ala Leu Leu Pro Pro Gly Gly 295 Pro Pro Pro Pro Asp Leu Pro Gly Ser Lys Asp

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Thr Lau Pha Tyr Thr Asp Phe Val Gly Glu Gly Leu Tyr Gln Gly Val 295 · Pro Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg His Tyr Asp Glu Gly 310 315 Val Arg Met Gly Ser Leu Gly Leu Phe Leu Gin Cye Ala Ile Ser Leu 325 33D Val Phe Ser Leu Val Met Asp Arg Leu Val Gln Arg Phe Gly Thr Arg 340 345 350 Ala Val Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala 360 365 Thr Cys Leu Ser His Ser Val Ala Val Val Thr Ala Ser Ala Ala Leu 375 380 Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr Leu Ala 395 Ser Leu Tyr His Arg Glu Lyo Gln Val Phe Leu Pro Lys Tyr Arg Gly 410 Asp Thr Gly Gly Ala Ser Ser Glu Asp Ser Leu Met Thr Ser Phe Leu 425 Pro Gly Pro Lys Pro Gly Ala Pro Phs Pro Asn Gly His Val Gly Ala 440 Gly Gly Ser Gly Leu Leu Pro Pro Pro Pro Ala Leu Cys Gly Ala Ser 455 Ala Cys Asp Val Ser Val Arg Val Val Val Gly Glu Pro Thr Glu Ala 470 475 Arg Val Val Pro Gly Arg Gly Ile Cys Leu Asp Leu Ala Ile Leu Asp 485 490 Ser Ala Phe Leu Leu Ser Gln Val Ala Pro Ser Leu Phe Met Gly Ser 505 fle Val Gln Leu 9er Gln Ser Val Thr Ala Tyr Met Val Ser Ala Ala 520 Gly Leu Gly Leu Val Ala Ile Tyr Phe Ala Thr Gln Val Val Phe Asp .535 Lys Ser Asp Leu Ala Lys Tyr Ser Ala

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Asp Asn Val Thr Asn Thr Ala Asn Glu Thr Cys Thr Lys Gln Lys Ala
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                               185:
His Asp Gln Lys Val Glu Gly Cyc Phe Asn Gln Leu Leu Tyr Asp Ile
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Arg Thr Asn Ala Val Thr Val Gly Gly Val Ala Ala Gly Ile Gly Gly
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actogragas assestetga agagetagte tateageate tgacaggtga attggatggt
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tetragasco atticarcos garageotgi tietateotg titaataaat tagittgggt
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                                                                    120
 agactitact attiticatat titaagacac atgatitate ctattitagt aacctggtte
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 atacgttaaa caaaggataa tgtgaacagc agagaggatt tgttggcaga aaatctatgt
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                                                                          120
aataaggcaa aatatatgaa acaacaggto togagatatt ggaaatcagt caatgaagga
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tgggt
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aanteetggg t
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                                                                        180
gtteteccag gttegecetg etgetecaag teteageage agectettt aggaggeate
ttotgaacta gattaaggoa gottgtaaat otgatgtgat ttggtftatt atocaactaa
                                                                        240
                                                                        -3 Q D -
cttccatctg ttatcactgg agasagccca gactccccan gacnggtacg gattgtgggc
                                                                        332
atanaaggat tgggtgaage tggegttgtg gt
      c210> 132
      322 د211>
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) . . . (322)
      <223> n = A, T, C or G
      c400> 132
actitiques titiquatat atasacaste tigggaesti cicetgassa ciaggigice
                                                                         60
agtggotaag agaactcgat ttcaagcaat tctgaaagga aaaccagcat gacacagaat
                                                                         120
etcaaattee eaaacagggg etetgtggga aaaatgaggg aggacetttg tatetegggt
                                                                         180
tttagcaagt taaaatgaan atgacaggaa aggettatit atcaacaaag agaagagttg
                                                                         240
                                                                         30D
ggatgettet aasaassat tiggtagaga asataggaat getnasteet agggaageet
                                                                         322
gtaacaatot acaattggto ca
      <210> 133
       <211> 278
       <212> DNA
       <213> Homo sapien
       ₹220>
       <221> misc_feature
       <222> (1)...(278)
       <223> n - A, T, C or G
      <400> 133
acaagootto acaagittaa otaaattggg attaatotti oigtanitai oigoataatt
                                                                          6D
ettgttttte tttecatetg getectgeet teacaattte teeaacaac tetattgeta
                                                                         120
ctatttaana annatoarna atcettecet ttangetatg ttnaatteaa actatteetg
                                                                         180
ctattcctgt titgtcaeeg azattatatt titceesets tgtntattig titgatgggt
```

```
cocargasse setastassa accaesagaga coagcotg
                                                                     278
      <210> 134
      <211> 121
      <212> DNA
      <213> Homo eapien
      <220>
      <2215 misc feature
      <222> (1) ... (121)
      \langle 223 \rangle n = A,T,C or G
      <400> 134
ptttenaaaa cttgtttage teestagagg aaagaatgtt aaseettgta tittaaaaea
                                                                      ៩០
tgattetetg aggitaaact tggtttteaa atgitatitt tacitgtatt tigctittgg
                                                                     120
                                                                     121
      <210> 135
      <211> 350
      <212> DNA
      <213> Homo sapien
      c220>
      <221> misc_feature
      <222> (1) ... (350)
      <223> n = A,T,C or G
      <400> 135
acttanaacc atgcctagea catcagaatc cetcaaagaa catcagtata atcctatace
                                                                      ៩៧
Blancaagig gigaciggit aagcgigcga caaaggicag ciggcacatt actigigige
                                                                     120
asacttgata cttttgttet aagtaggaac tagtatacag tneetaggan tggtacteca
gggtgcccc caactootgc ageogetect etgtgccagn ccctgnaagg aacttteget
                                                                     240
ccacctcast caagecetgg gecatgetse etgeaattgg etgaacaaac gtttgetgag
                                                                     300
ttcccaagga tgcaaagcct ggtgctcaac tcctggggcg tcaactcagt
                                                                     150
      <210> 136 ·
      <211> 399
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(399)
      <223> n = A, T, C or G
      <400> 136
tgtaccgtga agacgacaga agttgcatgg cagggacagg gcagggccga ggccagggtt
getstgattg tateogaata nteetogtga gaaaagataa tgagatgaeg tgageageet
                                                                     130
geagaettgt gretgeette aanaageeag meaggaagge eetgeetgee tiggetetga
                                                                     180
cotggoggod agocagocag ocacaggtgg gottettect tttgtggtga caacnocaag
                                                                     240
300
teccaggase cogggessag gecaterees cetacagees gestgeeese tggegtgatg
                                                                    360
ggtgcagang gatgaagcag ccagntgttc tgctgtggt
                                                                     199
      <210> 137
```

<211> 165
<212> DNA

<213> Homo sapien

```
とさきむっ
          <221> misc feature
          <222> (1)...(155)
          <223> n = A,T,C or G
          <400> 137
    actgglgtgg tngggggtga tgctggtggt anaagttgan gtgacttcan gatggtgtgt
                                                                           50
    ggaggaagtg tgtgaacgta gggatgtaga ngttttggcc gtgctaaatg agcttcggga
                                                                          120
                                                                          165
    ttggctggtc ccactggtgg tcactgtcat tggtggggtt cctgt
          <210> 138
          <211> 338
          <212> DNA
          <213> Homo sapien
          <220>
          <221> misc_feature
          <222> {1]...(338)
          <223> n = A,T,C or G
       c40D> 13B
                                                                          60
    acteactgga atgecacatt cacaacagaa teagaggtet gtgaaaacat taatggetee
    ttaacttoto cagtaagaat cagggacttg aaatggaaac gttaacagee acatgoccaa
                                                                          120
    tgetgggrag tetercatge etteracagt gasagggett gagaaaaate acateraatg
                                                                          180
    tcatgtgttt ccagccacac caaaaggtgc ttggggtgga gggctggggg catananggt
                                                                          240
    cangueteag gaageeteaa gttecattea getttgeeae tgtacattee eeatntttaa
                                                                          300
                                                                          338
    assauttast geethettet titttettig tassatte
          <210> 139
          <211> 382
          <212> DNA
          <213> Homo sapien
          <400× 139
                                                                           бQ
    gggaatette gittitiggea teiggittige etalageega egecaettig acagaacaaa
    gaaagggaet togagtaaga aggtgattta cagccageet agtgcccgaa gtgaaggaga
                                                                          120
    attoaaacag acctogtoat tootogtgtg agootggtog gotoaccgco tatoatotgo
                                                                          190
    atttgcctte ctceggtgct accggectct ggcccctgat gtctgtagtt tcacaggatg
                                                                          240
                                                                          300
    cettatitigt effetacace ceaeagggee ceetactict teggatgigt tittaataat
                                                                          360
    queaqueatg typoccator tectteatge coloretece titoriacea etgetgagtg
                                                                          3B2
    geetggaaet tgtttaaagt gt
          <210> 140
          <211> 200
          -212> DNA
          <213> Homo papien
          c220>
          <221> misc_feature
          <222> (1)...(200)
          <223> n = A,T,C or G
   <400> 140
accasanctt ctttctqttg tgttngattt tactataggg gtttngcttn ttctaaanat
                                                                          120
    actiticati taacanctit tgttaagtgt caggotgcac titgotccat anaattatig
                                                                          180
    ttttcacatt tcaacttgta tgtgtttgtc tottanagca ttggtgaaat cacatatttt
                                                                          200
    atattcagca taaaggag&A
```

```
<210> 141
       <211> 335
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (335)
       <223> n = A,T,C or 0
       <400> 141
actitatiti caasacacic ataigtigca aasaacacai agaasaataa agittiggigg
                                                                         60
gggtgctgac taaacttcaa gtcacagact tttatgtgac agattggagc agggtttgtt
                                                                        120
atgeatgtag agaacccaaa ctaatttatt aaacaggata gaaacagget gtetgggtga
                                                                        180
aatggttotg agaaccatco sattcacctg toagatgctg atamactage tettcagatg
                                                                        240
tttttctacc agttcagaga inggitaatg actanticca aiggggaaaa agcaagaigg
                                                                        300
attcacaaac caagtaattt taaacaaaga cactt
                                                                        335
      <210> 142
      <211> 459
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(459)
      <223> n = A, T, C or G
      <400> 142
accaggitaa tatigcesca tatateetti ecaatigegg getaaacaga egigtatita
                                                                         60.
gggfttgttta aagacaaccc agcttaatat caagagaaat tgtgaccttt catqqaqtat
                                                                        120
obgategasa aaacacbgag tottgacaaa tobbatbtta tocagatago agtobgatea
                                                                       180
caratggico ancamente anniante temaniata temanigita angettogic.
                                                                       240
ttcasacatc atagecaatg atgecceget tgeetataat eteteegaea taaaaceaca
                                                                       300
traacacete agtggccace aaaccattea gcacagette ettaaetgtg agetgtttga
                                                                       360
agetaceagt etgageacta ttgaetatnt ttttcanget etgaataget etagggatet
                                                                       420
cagcangggt gggaggaacc agctcaacct tggcgtant
                                                                       459
      <210> 143
      <211> 140
      <212> DNA
      <213> Homo sapien
      <400> 143
acattteett eeseessyte aggseteety gettetytyg psyttettat cacetysgys
                                                                        60
anatronant agtototot aganaggant agtgtracen accepacen teteretgag
                                                                       120
accetecgae tteectgtgt
                                                                       140
      <210> 144
      <211> 164
      <212> DNA
     <213> Homo sapien
     <220×
     <221> misc feature
     <222> (1) ... (164) .....
     <223> n = A,T,C or Q
```

```
<400> 144
acticagiae caecatacaa taacaacatt magigtatat tgccatotti gicatitici
                                                                         60
arctatacca cretecette tgaaaacaan aateactane caateactta tacaaatttg
                                                                        120
aggication tocatatity titticastan ggamessag stit
                                                                        164
       <210> 145
       <211> 303
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1) .... (303)
       <223> n = A,T,C or G
       <400> 145
                                                                         60
 acgtagacca tocaactttg tatttgtaat ggcaaacatc cagnagcaat toctaaacaa
 actggagggt atttataccc asttatccca tteattaaca tgccctcctc ctcaggctat
                                                                         120
 graggacage tetrataagt cogerragge atcragatac tacratttgt ataaacttca
                                                                         180
 qtagggagt ccatccaagt qacaggtcta atcaaaggag gaaatggaac ataagcccag
                                                                        240
__tagtaamath_ttgcttagct_gamacagcca_camaagmatt_accgccgtgg_tgattaccat
                                                                         3 D G
                                                                         303
       <210> 145
       <211> 327
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
        <222> {1}...(327)
       <223> n = A, T, C or G
       <400> 146
 actgoagote aattagaagt ggtototgac tittoatcane ttotocotgg getocatgac
                                                                          60
                                                                         120
 actgocetgg agtgacteat tgetetggtt ggttgagaga geteettige caacaggeet
 ccaagicagg grigggatti gittcritte cacatictag caacaataig ciggreacti
                                                                         180
 cctgaacagg gagggtggga ggagccagca tggaacaagc tgccactttc taaagtagcc
                                                                         240
 agaettgeee etgggeetgt caeacetaet gatgaeette tqtgeetgea ggatggaatg
                                                                         3 D D
                                                                         327
 taggogtgag ctgtgtgact ctatggt
        <210> 147
        <211> 173
        <212> DNA
        <213> Homo sapien
        <330>
        <221> misc feature
        <222> (1) ... (173)
        <223 n = A, T, C or G
        <400> 147
 acattgtttt tttgagataa agcattgana gagctctcct taacgtgaca caatggaagg
                                                                         60
                                                                         120
 actggameac stacccacat ctttgttctg agggataatt ttctgamaa gtcttgctgt
  atattoaago acatatgita tatattatto agittocatgi tiatagoota git
                                                                         173
```

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可是不可能的。 1940年中央中国大学的《大学》(1945年)

```
<211> 477
       <212> DNA
       <213> Homo mapien
       <220>
       <221> misc_feature
       <222> (1)...(477)
       <223> n = A,T,C or G
       <400> 148
acaaccactt tateteateg aattettase ceasacteae tesetgigee tittetateet
Atgggatata tiatitgatg ciccattica toacacatat atgaataata cactostact
                                                                       . 120
greetactae etgetgeaat aateacatte cetteetgte etgaecetga agceattggg
                                                                        180
giggicotag iggicateag iccangeetg cacettgage ceitgagete catigeteae
                                                                         240
nocanoccae cteaceace ecatectett acaeagetae etecttgete tetaacecea
                                                                        300
tagattaint ccasattcag tcsattaagt tactattaac actotacccg acatgtccag
                                                                        36D
Caccactggt aagoottoto cagootaeac acacacacac acacneacac acacacatat
                                                                        42D
ccaggeacag getaceteat etteacaate acceetttaa ttaccatget atggtgg
                                                                        477
       <210> 149
       <211> 207
       <212> DNA
       <213> Homo sapien
       <400> 149
acagitgiat tataatatea agaaataaac tigcaatgag ageatitaag agggangaac
                                                                         60
taacqtattt tagagagcca aggaaggttt ctgtggggag tgggatgtaa ggtggggcct
                                                                        120
gatgateaat aagagtcagc caggtaagtg ggtggtgtgg tatggggcaca gtgaagaaca
                                                                        180
tttcaggcag agggaacagc agtgaaa
                                                                        207
       <210> 150
      <21:1> 111
      <212> DNA
      <213> Homo sapiem
      <220>
      <221> misc_feature
      <222> (1)...(111)
      \langle 223 \rangle n = A,T,C or G
      <400> 150
accttgattt cattgetget etgatggass ceessetate taatttäget aasacatggg
                                                                         60
cacttaeetg tggtcagtgt ttggacttgt taactantgg catctttggg t
                                                                        111
      <210> 151
      <212> 198
      <212> DNA
      <213> Homo sapien
      <400> 151
agegoggeag gteatattga acattecaga tacctateat tactegatge tgttgataac
                                                                         60
agcaagatgg ctttgaactd agggtoacoa ddagdtattg gacettacta tgaaaaddat
                                                                        120
ggataccaac cogaaaacco ctatecegea cageeeactg tggteeeeac tgtetacgag
                                                                        180
gtgcatccgg ctcagt
                                                                        196
      <210> 152
 --- <211> 132
```

## <213> Homo sapien

		,					
	.<40D	o 152			•	•	
=		esestat aso	aagggagaaa	ttcctaaatg	taggagaaag	ataacagaac	60
_	ttoposotet	tratritagig	gtogaaacct	gatgetttat	gttgacagga	atagaaccag	120
٠	agggagttt	mt .	5-56	•			733
9	-777 <del>7</del> -74 - 4	3.					
		> 153					
7					•	· '	
	-	> 285		•			
		> DNA					
	<213	> Homo sapi	en .			•	
		·	9				•
	<220		*				
	<221	> misc_feat	ure				
		s (1)(28)					
	€223	> n = A, T, C	or G	:			
						•	
	<400	> 153		·	*	: '	
	ma ana coca	nnanamerca.	ctagecgtgg	tgtcatggcc	tecaaacatg	aaagtgtcag	60
_		· tatotoetda	tetaacaact	CETTACCACE	cccaccetca	.ccca3ca33+	120
-	anastaset	EBASSTRABA ·	atchtadect	Lagectique	ccggaggaag	frerreare.	180
2	nt nact ant	. asogettaar	coecoctcet	ggatgacggc	atctgtgaag	togtgcacca	24D
ш,: <b>С</b>	.betssess	cctataaas	recreterac	acquaqtnaq	gaatt	المهرد المنظومين والمنظومين المعادم	285
5	3cccacasa.	. cordradawa	6200350000	200000000000000000000000000000000000000			
		. 154					
:		1> 154			**		***
		1> 333		•			
		2> DNA	•				
	<213	3> Romo sapi	.en				
	=			• •			
	<401	)> 154		A		Fattatenac	. 60°
i	accacágto	tgttgggcce	. gggcttcatg	Becetter	сдванадиса	tattatcacc	120
i	accccaaati	t tttccttaaa	tatctttaac	: tgaaggggtc	agestettga	ctgcaaagac	180
	aa kaa moodii	, Fracecant	: aactecdact	. gaccctgatt	cotgazacty	eragrance	
	-+	n magterrakód	tottozoete	: ccettetteg	tabeacaeas	crccgacred	240
1	agtttcaca	atteteggge	cacctcgtcs	ttgctcctct	gasatasast	ccddadaard	300
	rtcaggcct	g totcatocat	: atggatette	. 099			333
•	, , ,			• •	* *		:
	c21	0> 155				*	
		1> 308					
		Z> DNA					-
		3 > Homo sapi	BD	1			
	~21	and and					
	20		•		,		
	<22						
		1> misc_feat					
		3> {3} · * · (3)		and the same of th		and the second	
√ ⁷	<22	$3 > n = \lambda, T, 0$	ç or G		*• • •		
						,	
	<40	0 > 155					. 60
	actggmaat	a ataaaaccc	a catcacagto	g ttgtgtcaas	gatcatcagg	gcatggatgg	
	gaaagtgct	t toogaactgi	t aaaqtqccta	acacatgato	s gatgattti	Arraragrer	120
	ttasatasa	o otocataca:	a actetects	e ctactected	: reddccccraa	CCCCAGCCCC	180
	ahreneget.	e actortetoi	t teatecagg	c ccagcatgta	s gtggctgact	cttettgget	240
	nettttage	c tecanaact	t tototgaage	Caaccaaac	: totangtyta	aggestgetg	300
		- Paterine Alla					308
	9¢cctggt		9				

<210> 156

<211> 295

<212> DNA

42D

480

```
<213> Homo sapien
       <400> 156
 accttgotog gtgcttggas catallagga actcaassta tgagatgata acagtgceta
                                                                          бD
 trattgatra ctgagagaac tgttagacat ttagttgaag attttctaca caggaactga
                                                                         12D
 gaataggaga ttatgtttgg coeteatatt eteteetate eteettgeet eattetatge
                                                                         180
 ctaatatatt ctcaatcaaa taaggttagc ataatcagga aatcgaccaa ataccaatat
                                                                         240
 assacraget gtotatectt segettttce setegeses seetteeceg ectat
                                                                         295
       <210> 157
       <211> 126
       <212> DNA
       <213> Homo sapien
       <400> 157 ·
 acaagtitaa atagigoigi cacigigoat gigoigaai gigaaatooa ccacattici
                                                                          60
gaagagcaaa acaaattotg toatgtaato totatottgg gtogtgggta tatotgtooc
                                                                         120
cttagt
                                                                         126
       <210> 158
      <211> 442
       c212> DNA
       <213> Homo sapien
       c220>
       <221> misc_feature
       <222> {1}...(442)
      <223> n = A, T, C \text{ or } G
      <400> 158
acceactggt citiggaaaca cocatcetta atacgatgat tittecigteg tgtgaaaatg
                                                                          БÔ
aanccagcag getgeeecta gtcagtcett cetteeagag aaaaagagat ttgaqaaaqt
                                                                         120
grotgggtam ticaccatta atticcicco commactoto tgagtotico otimatati
                                                                         180
ctggtggttc tgaccaaagc aggtcatggt ttgttgagca tttggggatcc cagtgaagta
                                                                       : 240
natytityta geetigeeta ettageeett eeeaegeaca aacggagigg cagagiggig
                                                                         300
ecascectgt titicecagic cacqiagaca gattcacagi geggaattei ggaageigga
                                                                        360
nacagaeggg etettigeag agregggaet elgagangga calgagggee belgeetebg
                                                                         920
tgttcattct ctgatgtcct gt
                                                                         442
      <210> 159
      <211> 498
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> [1] . . . (498)
      <223> n = A,T,C or G
      <400> 159
acticcaggit aacgitgitg titiccgitga geetgaacig aigggigacg tiglaggite
                                                                         60
tccaacaaga actgaggttg cagagegggt agggaagagt getgttccag ttgcacetgg
                                                                        120
gctgctgtgg actgttgttg attcctcact acggcccaag gttgtggaac tggcanaaag
                                                                        180
gigigitgit ggantigage togggogget giggtaggit gigggotett caacagggge.
                                                                        240
tgctgtggtg ccgggangtg eangtgttgt gtcacttgag cttggccagc tctggaaagt
                                                                        300
antanattet teetgaagge cagegetigt ggagetigges ngggteantg tigtgtgtaa
```

egaaccagtg etgetgtggg tgggtgtana tectecaeaa ageetgaagt tatggtgten

traggtaana atgtggttte agfgteertg ggengetgtg gaaggttgta nattgteace

<212> DNA

```
498
aagggaataa gctgtggt
      <210> 160
      <211> 380
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_teature
      <222> [1]...(3B0)
      <223> n = A, T, C or G
      <400> 160
acctgoator agottoortg coasactoad aaggagacat caacctotag acagggaaac
                                                                        60
agetteagga tactteeagg agacagages accageagea aaacaaatat teecatgeet
                                                                       120
ggagcatgge atagaggaag etganaaatg tggggtetga ggaagceatt tgagtetgge
                                                                       180
                                                                       240
cactagacat eteateagee aettgtgtga agagatgeee catgaceeca gatgeetete
conceptac etecatetes caesettes ettecaete tetataatte taacsteete
                                                                       300
gagaaaaatg qcagtttgac cgaacctgtt cacaacggta gaggctgatt tctaacgaaa
                                                                       360
cttgtagaat gaageetgga
                                                                       380
      c210> 161
      <211> 114
      <212> DNA
      <213> Homo sapien
      <400>.161
actocacate coetetgage aggoggttgt cgttcaaggt gtatttggcc ttgcctgtca
                                                                       60
cactglecae tggcccctta tccacttggt gcttaatccc tcgaaagagc atgt
                                                                       114
      <210> 162
      <211> 177
      <212> DNA
      <213> Homo sapien
      <4D0> 162
actiteteaa tegaateaaa teatacttag tetagittia atateeteat atateeaaa
gtbbbactac tobgataatt bigbaaacca ggtaaccaga acabccagto atacagottt
                                                                       120
togtgatata taacttogca ataacccagt ctogtgatac ataaaactac tcactgt
      <210> 153
      <211> 137
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1) ... (137)
      <223> n - A,T,C or G
      <400> 163
catttataca gacaggegtg aagacattca egacaaaaac gegamattet atceegtgac
                                                                       120
canagaagge agetaegget acceptacat cotggegtgg gtggccttcg cotgcaectt
catcagogge atgatgt
                                                                       137
      <210> 164
      <211> 469
```

```
<213> Homo sapien ...
      <220>
      <221> misc_feature
      <222> (1)...(469)
      c223> n \Rightarrow A,T,C or G
      <400> 164
ettaboacaa tgaatgitet cotgggeage gtigtgatet tigceacett egigacitta
                                                                         60
tgcaatgcat catgctattt catacctast gagggsgttc caggagattc saccaggasa
                                                                        120
tgcatggatc tcamaggman camacaccom atamactogg agtggcagac tgacametgt
                                                                        180
gagacatgca cttgctacga aacagaaatt tcatgttgca cccttgtttc tacacctgtg
                                                                        24D
ggttatgaca aagacaactg ccaaagaatc ttcaagaagg aggactgcaa gtatatcgtg
                                                                        300
gtggagaaga aggacccaaa aaagacctgt totgtcagtg aatggataat ctaatgtgct
                                                                        360
totagtaggo acagggetoe caggocaggo ctcattotoc totggeotot matagtomat
                                                                        420
gattgtgtag ccatgcctat cagtaaaaag atntttgagc aaacacttt
                                                                        469
      <210> 165
      <211> 195
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1)...[195]
    <223> n=A,T,C or G
      <400> 165
acagtttttt atamatatog acattgoogg cacetgoott cagtttcata aagctgotgo
                                                                        .60
atcogotyte atcoactatt cottygetag agtaaaaatt attottatag cocatyteec
                                                                        120
tgeaggeoge ecgeeogtag ttetegttee agtogtettg geacacaggg tgecaggaet
                                                                        180
                                                                        195
tcctctgaga tgagt
      <210> 166
      <211> 383
      c212> DNA
      <213> Homo capien
      <220>
      <221> misc_feature
      <222> {1}...(383)
      <223> n = A,T,C or G
      <400> 166
acatettagt agigigges atcaggggge cateagggte acagteacte alageerege
                                                                        60
cyaggtegga gteracarea reggtgtagg tgtgeteaat ettgggettg gegereacet
                                                                       120
ttggagaagg gatatgetge acacatgt ccacaaagec tgtgaacteg ccaaagaatt
                                                                       . 18D
tttgeagace agectgagea aggggeggat gtteagette ageteeteet tegteaggtg
                                                                       24 D
gatgecasee tegtetangg teegtgggaa getggtgtee aenteaceta caacetggge
                                                                       30D
gangatetta taaagagget eenagataaa eteeaegaaa ettetetggg agetgetagt
                                                                       360
nggggccttt ttggtgaact ttc
                                                                       383
      <210> 167
      c211> 247
      <212> DNA
      <213> Homo sapien
      <220>
```

```
<221> misc_feature
      <322> (1) ... (247)
      <223> n = A,T,C or G
      <400> 167
acegageras accttggera tadatgaane agagattaag actaaacere aagteganat
                                                                       6 D
tggagcagas actggagcaa gaagtgggcc tggggctgaa gtagagacca aggccactgc
                                                                       120
tatanccata cacagageca acteteagge caaggenatg gttggggcag anecagagae
                                                                       180
tcaatctgan tecaaagtgg tggetggaac actggteatg acanaggeag tgaetetgae
                                                                       240
                                                                        247
tgangte
      c210> 168
      <211> 273
      <212> DNA
      <213> Homo mapien
      <220>
      <221> misc_feature
      <222> (1) . . . (273)
      <223> n = A,T,C or G
      <400> 168
actictaagt titictagaag togaaggatt gianicalce tgaaaatggg titacticaa
                                                                        - 60
eatcorteen cottettett carnactete tatacteana gigicatett tocacaaagg
                                                                        12 P
getgacacet gageetgnat teteacteat ecetgagaag ceettteeag tagggtggge
                                                                        180
aatteceaac tteettgeca caagetteec aggetttete coetggaaaa etecagettg
                                                                        240
                                                                        273
agtoccagat acacteateg getgeceteg gea
      <210> 169
      c211> 431
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1) ... [431]
      c223> n - A,T,C or G
acageettgg ettecceaaa etecacagte teagtgeaga aagateatet tecageagte
                                                                         60
ageteagace aggoteanag gatgtgacat caacagttte tggtttcaga acaggttcta
                                                                        120
ctartgtres atgaccocc atacttecte assggetgtg gtasgttttg cscaggtgag
                                                                        180
ggcagcagas agggggtant tactgatgga caccatcttc tetgtatact ccacactgac
                                                                        240
cttgccatgg gcazaggccc ctaccacaza azcaatagga tcactgctgg gcaccagetc
                                                                        300
acgeacatea etgaeaaceg ggatggaaaa agaantgeea aettteatae atecaactgg
                                                                        36Q
anogigatet gataciggat tettaattac ettemange tietggggge catragetge
                                                                        420
                                                                        431
trgaaractg a
       <230> 170
       <211> 266
       <212> DNA
       ∠213> Homo sapien
       <2200ء
       <221> misc feature
       <222> (1) ... (266)
      <223> U = A,T,C or G
```

```
c400> 170
acctgtgggc tgggotgtta tgootgtgcc ggotgctgaa #$$ga$ttca gaggtggagc
                                                                        60
teaaggaget etgeaggeat tttgreaane eteteranag canagggage aacetacact
                                                                       120
cccogctaga aagaceccag allggagtcc tgggaggggg agtltggggtg ggcattlgat
                                                                       180
gtatacttgt caccignatg aangagccag agaggaanga gacgaanaig anatiggcct
                                                                       240
tcaaagctag gggtctggca ggtgga
                                                                       266
      <210> 171
      <211> 124B
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1), (1248)
      \langle 223 \rangle n = A,T,C or G
      <400> 171
ggcagccaaa tcataaacgg cgaaggactgc agcccgcact cgcagccctg gcaggcggca
ctggtcatgg amaacgaatt gttctgctcg ggcgtcctgg tgcatccgca gtgggtgctg
                                                                       120
teageogeae aetgitteea gaagitgagitg cagageteet acaccategg getgggeetg
                                                                       180
cacagtotty aggocyacca agagocaggy aggosgatgs tggaggocag cototocyta
                                                                       240
rggracecag agtaraacag accettgete getaargare teatgeteat caagttggae
                                                                       300
gaatoogtgt cogagtotga caccatoogg agcatoagca ttgcttogca gtgccctaco
                                                                       36D
geggggaaet ettgeetegt ttetggetgg ggtetgetgg ogaaeggeag aatgeetaee
                                                                       420
gtgetgeagt gegtgaaegt gteggtggtg tetgaggagg tetgeagtaa getetatgae
                                                                       480
eegrtgtacc accecageat gitetgegee ggeggaggge aagaccagaa ggacteetge
                                                                       54 D
ascygtgaet etggggggee cetgatetge asogggtaet tgesgggeet tgtgtettte
                                                                       БQD
ggaaaageee egtgtggeea agttggegtg ceaggtgtet acaecaacet etgeaaatte
                                                                       660
actgagtgga tagagaaaac cgtccaggcc agttaactct ggggactggg aacccatgaa
                                                                       720
attgaccecc aaatacatec tgoggaagga atteaggaat atetgtteec ageceeteet:
                                                                       780
costcapgcs caggagtesa ggescosago costcetos toaaareaag ggtacagate
                                                                       840
eccageceet ecteerteag acceaggagt ecagaceece cageceetee teretragae
                                                                       900
ccaggagtee agreectect ceetragace raggagtera garcorerag correctee
                                                                       960
etcagaceca ggggtecagg eccecaaece etcetceete agaetcagag gtecaagece
                                                                      1020
reastronto attororaga recagaggio caggiorag receienter ciragarora
                                                                      1080
graqtresat qccacctaga ctmtrcctqt acacaqtgcc cccttgtggc acqttqaccc
                                                                      1140
aacettadea gitggittit eatittingt ecetticeee tagateeaga aataaagtit
                                                                      1200
аададаадпу салаалаала алелаалалы лалалалы аллалала
                                                                      1248
      <210> 172
      <211> 159
      <212> PRT
      <213 > Homo sapien
      <220>
      <221> VARIANT
      <222> (1)...(159)
      <223> Xaa = Any Amino Acid
      <400> 172
Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro
                                    10
Leu Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser
            20
                                25
Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr
      ___35____4D___4D___
                                        45
Ala Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly
```

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```
Arg Met Pro Thr Val Lev Gln Cys Val Asn Val Ser Val Val Ser Glu
   65
   Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe
                                        90
   Cys Ala Gly Gly Gly Gin Xaa Glo Xaa Asp Ser Cys Asn Gly Asp Ser
                                    105
                                                         110
   Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe
                                120
   Gly Lys Ala Pro Cys Gly Gin Val Gly Val Pro Gly Val Tyr Thr Asn
                            135
                                                140
   Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Glo Ala Ger
   1.45
         <210> 173
         <211> 1265
         <212> DNA
         <213> Romo sapien
         <220> .
         <221> misc_feature
         <222> (1) ... (1265)
         \langle 223 \rangle n = A,T,C or G
         <4005 173
   ggcageerge aetegeagee etggeaggeg geactggtea tggaaaaoga attgttetge
                                                                            6 D
   togggogtoc togtgcatec goagtgggtg otgtcageog cacactgttt ccagaactec
                                                                           120
   tacaccateg ggetgggeet geacagtett gaggeegaee aagageeagg gageeagatg
                                                                           180
   giggaggrea quetetecqt acqqcaccca qaqtacaaca qacctiqci egetaacqac
                                                                           240
   cteatgetea teaagetigga egaateegtig teegagtetig acaceateeg gageateage
                                                                           300
   attgottogo agtgerotar ogoggggaac tettgertog titletggetg gggtetgetg
                                                                           360
                                                                           420
   geganeggig ageteneggg igtgigteig ceetettenn ggaggieete igeeengieg
   cgggggctga cccagagete tgcgtcccag gcagaatgcc taccgtgctg cagtgcgtga
                                                                           480
   acetgtcegt getgtctgag gaggtctgca gtaagctcta tgaccegctg taccacccca
                                                                           540
   gcatgttctg cgccggcgga gggcaagacc agaaggactc ctgcaacggt gactctgggg
                                                                           600
   ggcccctgat ctgcaacggg tacttgcagg gccttgtgtc tttcggaaaa gccccgtgtg
                                                                           660
   gecaagitgg ogtgecaggi gictacacca accietgeaa atteactgag iggalagaga
                                                                           720
   anacogicon ggocagitam cictogogac togoganecem tomanitose eccenamiae
                                                                           780
   atcotgogga aggasttosg gastatotgt toccagoood toctoortos ggoodsgas
                                                                           640
   tecaggeece cagecectee teceteaaac caagggtada gatocecage contenteec
                                                                           900
   teagacecag gagtecagae eccecageer etectecete agacecagga gtecageece
                                                                           96 D
   tecteentea gacecaggag tecagacece coagececte etectteaga eccaggggtt
                                                                          1020
   gaggcocca acceptocte ottoagagte agaggtecaa geocceaace cetegttece
                                                                          1080
   cagacccaga ggtnnaggte ccagccccte ttecntcaga eccagnggte caatgccace
                                                                          1140
                                                                          1200
   tagatitites eignacadag igosecetig iggnanging acceasest accapings
                                                                          125Q
   ttttcatttt tngtecettt eccetagate cagaaataaa gtttaagaga ngngcaaaaa
                                                                          1265
   SEESS
        <210> 174
         <211> 1659
         <212> DNA
         <213> Homo sapien.
         <220>
<221> misc_feature
<222> (1) ... (1459)
        \sim <2235 n'=A,T,C' or G'
```

1167

```
<4005 174
ggbcagccgc acactgtttc cagaagtgag tgcagagetc ctacaccate gggetgggec
                                                                        δD
tockcaptet tgasgoogae caagagocag ggagocagat gstggasgoc agecteteeg
                                                                        120
targgracer agastacase asaccettse tesetasesa ceteatsete ateaasttss
                                                                        180
acquatecqt greegagtet gaeaccated ggagdateag cattgetteg cagregocota
                                                                        240
cogoggggaa otottgooto gtttotggct ggggtetgot ggegaaeggt gageteaegg
                                                                        300
gtgtgtgtct geceteltea aggaggteel etgeceagte gegggggetg acceagaget
                                                                        360
etgegteeca ggeagaatge ctacegtget geagtgegtg aacgtgtegg tggtgtetga
                                                                        420
ngaggtetge antmagetet atgacceget gtaccaccec ancatgttet gegeeggegg
                                                                        480
agggcaagac cagaaggact cetgeaacgt gagagagggg aaaggggagg geaggegact
                                                                        540
caggeaaggg tggageeggg ggagacagag acacacaggg ccgcatggcg agatgcagag
                                                                        600.
atggagagac acacagggag acagtgacaa ctagagagag aaactgagag aaacagagaa
                                                                        660
Atamacacag gaatamagag aagcamagga agagagaaac agamacagac atggggaggc
                                                                        720
agaaacacac acaratagaa atgcagttga cottocaaca gcatggggco tgagggcggt
                                                                        780
gacetecace caatagaaxa teetettata aettttgaet ceeeaaxaa etgaetagaa
                                                                        840
atagcetact gitgacgggg agcettacca ataacataaa tagtcgatti aigcatacgt
                                                                        900
tttatgcatt catgatatac ctttgttgga attttttgat atttctaagc tacacagttc
                                                                       96D
gtctqtgaat ttttttaaat tqttgcaact ctcctaaaat ttttctgatg tgtttattga
                                                                      1020
aaaaateeaa gtataagegg aettgegeat teaaaceagg gtegtteaag ggeeaaetgt
                                                                      1080
gtacccagag ggmaacagtg acacagatte atagaggtga aacacgaaga gaaacaggaa
                                                                       1140
aastcsagac tctacsaaga ggctgggcag ggtggctcat gcctgtaatc ccagcacttt
                                                                      1200
gggaggcgag gcaggcagat cacttgaggt amggmgttca agaccagcct ggccmammig
                                                                      1260
gtgaaateet gtetgtaeta aaaatacaaa agttagetgg atatggtgge aggegeetgt
                                                                      1320
aatoocagot acttgggagg otgaggcagg agaattgott gaatatggga ggcagaggtt
                                                                      1380
gaagtgagtt gagatcacac cactatactc cagetggggc aacagagtaa gactetgtet
                                                                      1440
casaasaasa assaasaaa
                                                                      1459
      <210> 175
      <211> 1167
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(1167)
      <223> n = A, T, C or G
      <400> 175
gegeageect ggeaggegge actggteatg gaasacgaat tgttetgete gggegteetg
                                                                        бD
gigcalcogo agigggigoi gicagoogoa caciglitico agaactocia caccalcogg
                                                                       130
ctgggcctgc acagtcttga ggccgaccaa gagccaggga gccagatggt ggaggccagc
                                                                       180
                                                                       240
ctotoogtac ggcaccoaga gtacaacaga ctottgcteg ctaacgacet catgctcate
                                                                       300
aughtggacg aatoogtgto cgagtotgac accatoogga goatougoat tgottogoag
                                                                       360
tgccctaccg cggggaactc ttgcctcgtn tctggctggg gtctgctggc gaacggcaga
                                                                       420
atgectaceg tyctgeactg egtgaacgtg teggtggtgt etgaggangt etgeagtaag
ctctatgacc cgctgtacca ccccagcatg ttctgcgccg gcggagggca agaccagaag
                                                                       480
                                                                       540
gactootgea aeggtgacte tgggggeee etgatetgea Aegggtaett geagggeett
gtgtctttcg gaaaagecee gtgtggecaa ettggegtge eaggtgteta caecaacete
                                                                       600
tgcaaattca ctgagtggat agagaaaacc gtccagncca gttaactctg gggactggga
                                                                       66Q
acccatgaaa tigaccccca aatacatcct goggaangaa ticaggaata totgitccca
                                                                       720
geocetecte ceteaggeee aggagtecag geocecagee cetectecet caaaceaagg
                                                                       78D
gtacagates scagesests steesteaga escaggagte cagassesse agreestant
                                                                       840
                                                                       900
contragace cappagateea geoccatecte entragacge aggapterag accecceage
                                                                       960
cententees teasacces gggtgeagge cereaacces tenteentes gagteagagg
treaageree casecerteg treeceagae cesgaggine aggiceeage certectee
                                                                      1020
tragacceas ogsteraats coacctagan introctyta cacastscer cettytysea
                                                                      1080
```

ngttgaccca accttaccag ttggtttttc attttttgtc cctttcccct agatccagaa

atamagtata agagamagege aanmana

```
<310> 176
      <211> 205
      <212> PRT
      <213> Homo sapien
      <220>
      c221> VARIANT
      <222> (1) ... {205}
      <223> Xaa = Any Amino Acid
      <400> 176
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
                                25
            20
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Net Val
                            40
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Leu Leu
                        55
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
                    70
Asp Thr lie Arg Ser The Ser He Ala Ser Gln Cys Pro Thr Ala Gly
                                    . 90
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg Met
                                                     110
                                105
Pro Thr Val Leu His Cys Val Asn Val Ser Val Val Ser Glu Xaa Val
                             120
Cys Ser Lys Leu Tyr Asp Pro Lsu Tyr Ris Pro Ser Met Phe Cys Ala
                        135
Gly Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly Gly
                    150
Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly Lys
Ala Pro Cys Gly Gln Leu Gly Val Pro Gly Val Tyr Thr Asn Leu Cys
                                 185
Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Xaa Ser
        195
       <210> 177
       <211> 1119
       <212> DNA
       <213> Homo sapien
       <400> 177
 gogoactogo agecetggoa ggoggoactg gtcatggaaa acgaattgtt etgetogggo
                                                                         КÓ
 processing are geages getsets a seescacaet otheragaa etectacaee
                                                                        120
 atcoggctog occtocacae tettoaggco gaccaagage cagggagcoa gatggtggag
                                                                        180
 presgectet cegtacgges eccagagtac ascagacect tgetegetas egaceteatg
                                                                        240
 ctcatcaagt tggacgaatc cgtgtccgag tctgacacca tccggagcat cagcattgct
                                                                        300
 togcagtgoc chacogoggg gaactottgo chogtttotg gotggggtot gotggegaac
                                                                        360
 gatgetgtga ttgccatcca gtcccagact gtgggagget gggagtgtga gaagetttcc
                                                                        420
 caaccetgge agggttgtac cattleggea actteeagtg caaggaogte etgetgeate
                                                                        480
 ercactggt geteactact geteactgea teacceggaa cactgtgate aactagecag
                                                                        540
 carcataget etergaagte agactateat gattactgtg ttgartgtge tgtetattgt
                                                                        600
 actaaccatg ccgatgttta ggtgaaatta gcgtcacttg gcctcaacca tottggtatc
                                                                        66D
 cagttatect cactgaattg agattteetg etteagtgte agecattece acataattte
                                                                        720
```

tgacctacag aggtgaggga tcatataget cttcaaggat getggtacte eceteacaaa

```
ttrattroto otgitigiagi gasaggigog coetelggag celeccaggg igggigliges
                                                                        84 n
entracaatq atgastgtat gatrgtgttr coattacces asgectttas atrectests
                                                                        90D
cteagtacae cagggraggt ctagcatttc ttcatttagt gtatgctqtc cattcatgea
                                                                        96 D
aceaceteag gacteetgga ttetetgeet agttgagete etgeatgetg ceteettggg
                                                                       1020
gaggtgaggg agagggocca tggttcaatg ggatotgtgc agttgtaaca cattaggtgo
                                                                       1080
ttaataaaca gaagotgtg& tgttaaaaaa aaaaaaaaa
                                                                       1119
      <210> 178
      c211> 164
      <212> PRT
      thique omoH <213>
      <220×
      <221> VARIANT
      <222> (1)...(164)
      <223> Xaa - Any Amino Acid
      <400> 178
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
                                     10
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
                                25
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu Leu
                        55
                                             60
Ala Asn Asp Leu Met Leu Ile Lys Lou Asp Clu Ser Val Ser Glu Ser
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Asp Ala Val .
                                105
Ile Ala Ile Gln Ser Xaa Thr Val Gly Gly Trp Glu Cys Glu Lys Lou
                            120
Ser Gin Pro Trp Gin Gly Cys Thr Ile Ser Ala Thr Ser Ser Ala Arg
                        135
Thr Ser Cys Cys Ile Leu Thr Gly Cys Ser Leu Leu Thr Ala Ser
                                        155
Pro Gly Thr Leu
      <210> 179
      <211> 250
      <212> DNA
      <213> Homo sapien
      <400> 179
ctggagtgcc ttggtgtttc aagcecctgc aggaageaga atgcaccttc tgaggcacct
                                                                        60
ccagetgeec coggeoggg galgegagge leggageace eligecegge igigaligel
                                                                       120
gecaggeact giteatetea gettitetgi ebettigete coggeaageg ettetgetga
                                                                       180
asgiticatal diggageous algicitaad gaataaaggi oocabgoloo accogaaaaa
                                                                       240
ESSESSAB
     <210> 180
     <211> 202
     <212> DNA
```

<213> Homo eapien

```
<400> 180
actageccag tgeggeggaa teccategeg tegggeccaa cacaatgget accettaaca
                                                                         60
teacceagae eergeceetg coogtgeece acgetgetge taacgacagt atgatgetta
                                                                        130
ctctgctact cggaaactat ttttatgtaa ttaatgtatg ctttcttgtt tataaatgcc
                                                                       180
                                                                        202
tgatttaasa asaasaaasa &&
      <210> 181
      <211> 558
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (558)
      <223> n = A, T, C or G
      <40D> 1B1
tecyttigkt naggittkkg agacamoock agacetwaan eigigicaca gacticyngg
                                                                         60
aatgtttagg cagtgctagt aatttcytog taatgattet gttattactt tectnattet
                                                                        120
                                                                        180
ttattoetet ttettetgea gattaatgaa gitgaasati gaggiggata aalacaasaa
ggtagtgtga tagtataagt atctaagtgc agatgaaagt gtgttatata tatccattca
                                                                        240
asstratges agtragrast tacteagggt taactasatt actttastat getgttgaac
                                                                        300
ctactotett cottegectag aaaaaattat aaacaggact ttettaettt eegaagccaa
                                                                        360
attgatesta ttotatgtto tessegttgg gclatacets sattettesg sastetggaw
                                                                        420
ttttattccc aggaatatgg kgttcatttt atgaatatta cacrggatag awgtwtgagt
                                                                        480
asaaycagtt ttggtwaata ygtwaatatg tombaaataa acaakgottt gacttattto.
                                                                        540
                                                                        550
саалаваль лачалалал
      <210> 182
      <211> 479
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (479)
      <223> n = A,T,C or G
      <400> 182
                                                                         60
acagggwttk grggatgcta agsccccrga rwtygtttga tccaaccctg gcttwttttc
agaggggaaa atgggggccta gaagttacag macatytagy tggtgcgmtg gcacccctgg
                                                                        120
estdaradag asteccyagt agetgggart acaggearae agtractgaa geaggeeetg
                                                                        180
ttwgcaatto acgttgccac ctccaactta aacattotto atatgtgatg toottagtca
                                                                        240
                                                                        3 D G
ctmaggttaa actitoccac ocagamaagg caacttagat maamiottag agtactitom
tactmeteta agtectette cagecteact kkgagteetm cytgggggtt gataggaant
                                                                        360
                                                                        420
ntotottggo tttotoaata aartototat ydetotoatg Ettaatttgg tacgoatare
awtgstgara aaattaasat gttotggtty mactitaaaa araasaasaa aaasaassa
                                                                        479
      <210> 183
      <211> 384
      <212> DNA
      <213> Bomo sapíso
      <400> 183
aggreggage agaagetasa gecasageee aagaagagtg geagtgerag cartggtgre
                                                                         60
                                                                        120
agtaccagta ccaataacag tgccagtgcc agtgccagca ccagtggtgg cttcagtgct
ggtgccagec tgaccgccac teteacattt gggetetteg etggcettgg tggagetggt
                                                                        180
gorageacca giggeagete tggigerigi ggittetect acaagigaga tilitagatat
                                                                        240
```

THE WORLD STREET

```
tgttaateet gecagtettt etetteaage eagggtgeat eeteagaaac etacteaaca
                                                                        300
cagcacteta googocact atcaatcaat tgaagttgac actotgcatt aratetattt
                                                                        36 D
                                                                        384
gccatttcaa esseessae aaaa
      <210> 184
      <211> 496
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1),.,{495}
      <223> n = A,T,C or G
      <400> 184
accgaattgg gaccgctggc ttataagcga tcatgtyynt corgtatkac ctcaacgagc
                                                                      €0
agggagatog agtotataog otgaagaaat tigacoogai gggacaacag accigotoag
                                                                        120
cocatectge toggttetec ccagatgaca astacteteg acacegaate accateaaga
                                                                       180
aacqcttcaa ggtgctcatg acccagcaac cgcgccctgt cctctgaggg tcccttaaac
                                                                       240
tgatgtottt totgocacct gttacccotc ggagactcog taaccaaact cttcggactg
                                                                       300
tgagecetga tgeettittg eeageeatac tetttggeat ceagtetete gtggegattg
                                                                       36D
attatgettg tgtgaggeaa teatggtgge ateaeceata aagggaacae atttgaettt
                                                                       42D
tttttctcat attttaaatt actacmagaw tattmmagaw waaatgawtt gaaaaactst
                                                                       480
taaaaaaaa aaaaaa
                                                                       496
      <210> 185
      <211> 384
      <212> DNA
      <213> Homo sapien
      c400> 185
gctggtagcc tatggcgkgg cccacggagg ggctcctgag gccacggrac agtgacttcc
                                                                        60
                                                                       120
caagtatoyt gogosgogte thetacogte cotacotgoa gatettoggs cagattocco
aggaggacat geacgteged etdategage adageaadtg ytogtoggag cooggettot
                                                                       180
gggcacarec tectggggec caggegggca cetgegtete coagtatgec aactggetgg
                                                                       240
                                                                       300
tggtgctgct cotcgtcate ttcctgctcg tggccaacat cotgctggtc aacttgctca
togocatgot cagotacaca tocggcaaag tacagggcaa cagogatete tactgggaag-
                                                                       360
pogoagogtt accgcctcat cogg -
                                                                       384
      <210> 185
      <211> 577
      <212> DNA
      <211> Romo gapien
      <220>.
      <221> misc_feature
      <222> (1)...(577)
      <223> n = A, T, C or G
      <4DQ> 186
gagttagete etceacace ttgatgaggt ogtetgeagt ggcetetoge tteatacege
                                                                        БÔ
thecatogic atactgragg trigecacca cytechgges teliggggeg gentaatatt
                                                                       120
ccaggaanct ctcaatcaag tcaccgtcga tgaaacctgt gggctggttc tgtcttccgc
                                                                       1B0
toggtatgaa aggateteer agaaggagty otegatette eccaeaettt tgatgacttt
                                                                       240
etigaginga tintgoatgi onagoaggag gitgiacoag cicinigaca gigagginac
                                                                       3 D D
cagecetate atgregitga mogtgeegaa gareacegag cettgtgtgg gggkkgaagt
                                                                       36D
ctcacceaga tretgeatta ecagagagec gtggcaaaag acattgacaa actcgcccag-
                                                                      420
gtggaaaaag amcamoteet ggargigetn geegeteete gtemgliggt ggeagegetw
```

```
teettttgae acacaaacaa gttaaaggea tetteageee eeagaaantt gteateatee
                                                                       540
aagaintege acageacina tecagitigg attaaat
                                                                       577
      <210> 187
      <211> 534
      <212> DNA
      <213 > Homo sapien
      <220>
      c221> misc feature
      <222> (1),..(534)
      <223> n = A,T,C or G
      <400> 287
ascatettee tgtataatge tgtgtaatat egateegatn ttgtetgatg agaatyeatw
                                                                         60
actkggssss gmsscattes agcctggaca ctggtattaa aattcacaat atgcaacact
                                                                        120
ttaaacagtg tgtcaatctg ctcccyynac tttgtcatca ccagtctggg aakaagggta
                                                                        180
tgeoctatte acaectgtta asagggeget asgestettt gattessest ettttttt
                                                                        240
gacacaagte cgaaaaaage sasagtaase agttatyaat ttgttagees atteacttte
                                                                        300
treatgggac agagecatyt gattlasaas gcaaattgca taatattgag cttygggage
                                                                        360
tgatatttga geggaagagt ageettteta etteaceaga cacaacteec ttteatattg
                                                                        420
ggatgttnac naaagtwatg tetetwacag atgggatget titgtggcaa ttetgttetg
                                                                        480
aggatotoco agittattia coacitgoac aagaaggogt titeticeto aggo
      <210> 188
      <211> 761
      <212> DNA
      <213> Homo sapien
      <220>
       <221> misc_feature
       <222> (1) ... {761}
     . <223> n + A,T,C or G
       <400> 188
agaaaccagt atctctnama acaacctctc ataccttgtg gacctaattt tgtgtgcgtg
                                                                         60
tytytytycy cycatettat atagacagge acatettttt taettttyta asagettaty
                                                                        120
 cctctttggt atctatatct gtgaaagttt taatgatctg ccataatgte ttggggacct
                                                                        180
tigicticig igiaaatggi actagagaaa acacctaint tatgagicaa tetagitngi
                                                                        240
tttattogac atgaaggaaa tttocagatn acaacactna caaactotee otkgackarg
                                                                        300
ggggacasag saasgcassa ctgamcatas rasacsatwa cctggtgaga arttgcatas
                                                                        360
acagasatwr ggtagtatat tgaarnacag catcattaaa rmgttwikti wiictccctt
                                                                        420
gcaaaaaaca tgtacngact tcccgttgag taatgccaag ttgttttttt tatnataaaa
                                                                        480
 cttgcccttc attacatgtt tmaaagtggt gtggtgggcc aaaatattga aatgatggaa
                                                                        540
 ctgactgata aegotgtaca aateegoegt gtgccteece agcaacecag teatgttgac
                                                                        600
 atgettaett caceaatget aettteetta taaatgtttg ctaaaataca etttgaacta
                                                                        660
 tttttetgin itcccagage tgagaintia gattitatgi agtatnaagi gaaaaantac
                                                                        720
                                                                        761
 gesaataata acattgaaga aaaananaaa aaanaaaaaa a
       <210> 189
       <211> 482
       <212> DNA
       <213> Home sapien
       <220>
       <221> misc feature
       <2225 (1) . . . (492)
       <223> n = A,T,C or G
```

```
<400> 189
 ttttttttt tttgccgatn ctactatttt attgcaggan gtgggggtgt atgcaccgca
                                                                         60
 caccggggct atmagaagca agaaggaagg agggagggca ragccccttg ctgagcaaca
                                                                        120
 amprograte etgecttete tgtetetete etggtgemgg cacatggggm gacetteee.
                                                                        180
 Aeggragggg ccaccegter aggggtggga atacaggggg tgggangtgt gcataagaag
                                                                        24Û
 tgataggeac aggecaccog gtacagacco ctoggetect gacagginga tittegaccag
                                                                        300
 gtcattgtgc cotgoccagg cacagogtan atotggaaaa gacagaatgc tttcottttc
                                                                        360
 azatttggot ngtoxtngaa ngggosnttt tocoanting goinggioti ggisonotig
                                                                        420
 gttoggecca geteencett casaasntst teaccennet cenaattget tgenggneec
                                                                        480
 CÓ
                                                                        482
      <210> 190
       <211> 471
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (471)
      \langle 223 \rangle n = A.T.C or G
      c400> 190
tttttttttt ttttaaaaca gtttttcaca acaaaattta ttagaagaat agtggttttg
                                                                        60
assactotog catecagtga gasetaccat acaceaestt acagetngga atgineteca
                                                                       120
satytytyyt yaaalgatay aatygaarya ticaatytta cacatyysyy aaagaayaay
                                                                       180
cgcttttgac atacaatgca caaaaaaaaa aggggggggg gaccacatgg attaaaattt
                                                                       240
taagtactca tcacatacat taagacacag ttctagteca gtcnaaaatc agaactgcnt
                                                                       300
tosassattt catoratges atcrearess agesettmet togetgetest gamineters
                                                                       360
ctacatonac citgatcatt gocaggaach aasagithaa ancachongt acaaaaanaa
                                                                       42D
tetgtaattn anticaacet eegtaengaa aaatniinii tatacaetee e
                                                                       471
      <210> 191
      <211> 402
      <212> DNA .
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(402)
      <223> n = A,T,C or G
      <400> 191
gagggattga aggtotytto tastytoggm otyttoagec accompleta acmagttget
                                                                        60
girticract cactgicigt asgettitta acceagacwg teteticata satagaacaa
                                                                       120
attettence agteacatet totaggacet ttttggatte agttagtata agetetteca
                                                                       180
cttcctttgt taagacttca totggtaaag tottaagttt tgtagaaagg aattyaattg
                                                                       24D
ctogitatet aacaatgice tetecitgaa giattigget gaacaaceca cetazagice
                                                                       30Ď
ctttgtgcat ccattttaaa tatacttaat agggcattgk tncactaggt taaattctgc
                                                                       360
aagagteate tgtetgeaaa agttgegtta gtatatetge ea
                                                                       402
      <210> 192
      <211> 601
      <212> DNA
      <213> Homo mapien
```

<221> misc_feature

240

300

36 392

```
c222> (1) ... (601)
c223> n = A,T,C or G
```

```
<400> 192
gageteggat cesatastet tigtetgagg geageaeaca taineagige caiggnaaci
                                                                        ĠΦ
                                                                       120
ggtetacccc acatgggage ageatgeogt agntatataa ggteattecc tgagteagac
atgoytyttt gaytacogtg tgccaagtgc tggtgattet yaacacacyt ccatcocgyt
                                                                       180
cttttgtgga aaaactggca cttktctgga actagcarga catcacttac aaattcsccc
                                                                       240
acquirent tonnaggtot accasagega yterigeatt getititigte ceteeggeae
                                                                       300
cagttqtcas tactaacccq ctqqtttqcc tccatcacat ttqtqatctq tagctctqqa
                                                                       350
tacatotoot gacagtactg aagaacttot tottttgttt caaaagcare tottggtgoo
                                                                       420
tgttggatea ggttcccatt tcccagtcyg aatgttcaca tggcatattt wacttcccac
                                                                       480
aaaacattgo gattigaggo toagcaacag caaatcolgt tooggoattg golgcaagag
                                                                       540
cutogatgta greggerage greaaggeag grgerqtgag crecarcage agragaagea
                                                                       600
      <210> 193
      <211> 608
      <212> DNA
      <213> Homo sapien
    c2205
      <221> misc_feature
      <222> {1] ... (608}
      <2235 a = A,T,C or G
      <400> 193
atacagecca nateccaeca ogazgatgeg ettgttgaet gagazeetga tgeggteact
                                                                        60
ggteccgetg tagecceage quetetecae etgetggaag eggttgatge tgeactcytt
                                                                       120
cecaacgcag gcagmagegg gscoggtcaa tgaactecay tegtggettg gggtkgaegg
                                                                       180
tkangtgeng gaogaggetg accaretege ggteracrag gatgeregae tgtgegggae
                                                                       240
                                                                       300
ctgcagcgaa actcctcgat ggtcatgagc gggaagcgaa tgaggcccag ggccttgccc
                                                                        36D
agaacettee geetgitete tggegieace tgeagetget geegetgaux etoggeeteg
quecagogga casaoggett tgaacageeg caceteaegg atgeceagtg tgtegogete
                                                                        42D
caggammgsc accagestyt ecaggteaat greggtgaag ccctccgcgg grratggcgt
                                                                        480
ctgcegtgtt tttgtcgatg ttctccaggc acaggctggc cagctgcggt tcatcgaaga
                                                                       540
gtegegeetg egtgageage atgaaggegt tgteggeteg eagiteitet teaggaacte
                                                                       600
cacqcaat
      <210> 194
       <211> 392
      <212> DNA
      <213 > Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(392)
      <223> n = A, T, C or G
      <400> 194
                                                                        6 D
gaacggetgg accttgeete geattgtget tgetggeagg gaatacettg geaageagyt
                                                                        120
ccagiccegag cagececaga regetgeege eegaagetaa geetgeetet ggeetteeee
```

tocgooteaa tgeagaacca gtagtgggag cactgtgttt agagttaaga gtgaacactg

trigatitia citgggaatt tectetgita tatagettit eccaatgeta atticeaaac

taaagaaaat attactgtta catatactgc tigcaatttc tgtatttatt gkinctatgg

accaccaca analaceaty titycotytt angityteta analinggty ettotytatt

asstantat egitattaaa ggitgicant co

```
<210> 195
      <211> 502
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(502)
      <223> n = A,T,C or G
      <400> 195
ccattkgagg ggtkaggkyc cagttyccga gtggaagaaa caggccagga gaagtgcgtg
                                                                        60
ccgagctgag gcagatgttc ccacagtgac ccccagagcc stgggstata gtytctgacc
                                                                        120
cetencaagg aaagaceaes thetggggae atgggetgga gggeaggaee tagaggeaee
                                                                        180
aagggaagge cecatteegg ggatgtteee egaggaggaa gggaagggge tetgtgtgee
                                                                        240
ccccaegagg aagaggccct gagtcctggg atcagacacc cottcacgtg tatccccaca
                                                                        300
casatgcaag ctcaccaagg toccctctca gtccccttcc stacaccctg amoggccact
                                                                        36 D
geoscacaco caccoagago acgocaccog coatggggar tgtgctcaag gartegongg
                                                                        420
gearcataga catetratee cagaagaga cagaatetee aatagaraga etgaremett
                                                                        480
gctnanaaaa asaasnasaa aa
                                                                        502
      <210> 196
      <211> 665
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (665)
      <223> n = A,T,C or G
      <400> 196
ggttactigg titcattgcc acceptiagt ggatgtcatt tagaaccatt tigictgctc
                                                                         60
cctctggaag ccttgcgcag agcggacttt gtaattgttg gagaataact gctgaatttt
                                                                        120
wagetgtttk gagttgatts geaccactge acceacaet teaatatgaa aacyawttga
                                                                        180
activatitat tatottigtga anagtataac antgamaatt ttigtteetac tigtatikate
                                                                        240
aagtatgatg aaaagcaawa gatatatatt cilitaltat gitaaaliat gaitgccait
                                                                        300
attmatcggc aaaatgtggm gtgtatgttc ttttcacagt aatatatgcc ttttgtaact
                                                                       360
tcacttggtt attttattgt aaatgartta caaaattott aatttaagar aatggtatgt
                                                                       420
watatttatt teattaattt ettteetkyt ttaeytwaat tttgaaaaga wtgcatgatt
                                                                       480
teltgacaga aalegatett galgetgigg aagtaglitg accedeatee claigagiit
                                                                       540
ttottagast gtataasggt tgtagcccat cnaacttosa agaaaaaaat gaccacatsc
                                                                       600
tttgcaatca ggctgaaatg tggcatgctn ttctaattcc aactitataa actagcaaan
                                                                       650
aagtg
                                                                       665
      c210> 197 .
      <211> 492
      <212> DNA
      <213> Homo Bapien
      <220>
      <221> misc_feature
      c222> (1) ... (492}
      <223> n = A,T,C or G
      <400> 197.
ttttnttttt tttttttgc aggaaggatt coatttattg tggatgcatt ttcacaatat
                                                                        60
atgtttatig gagcgatcca ttatcagtga asagtatcaa gigtitataa naittitiagg
                                                                       120
```

```
aaggoagatt cacagaacat gotngtongo ttgoagtttt acctegtana gatnacagag
                                                                           180
aattatagto naaccagtaa acnaggaatt tacttttcaa aagattaaat ccaaactgaa
                                                                           240
casastteta cootgasact tactecatee asstattggs atsanagtes geagtgatac
                                                                           300
attotottot gesotttaga tittotagee aaetatgies tagigatoag gaegagotot
                                                                           360
tgttcaaaag tacsacmaag caatgttece ttaccatagg cettaattca aactttgate
                                                                           420
cattteacte ceateacggg agteaatget acetgggaca ettgtatttt gtteatnetg
                                                                           480
                                                                           492
ancatggett aa
       <210> 198
       <211> 478
       <212> DNA
       <213> Homo sapisn
       c220>
       <221> misc feature
       <222> (1) ... (478)
       <223> n = A,T,C or G
       <400> 19B
ttintitign atticantet gtannaanta ttitcattat gittattana aaaatainaa
                                                                            60
tytntecacn acaaatcatn ttacninagt aagaggecan etacattyta caacatacac
                                                                           130
tgagtatett ttgasasgga casgtttass gtanacnest attgeegane atanesestt
tatacatgge ttgattgata tttageacag canaaactga gtgagttace agasanasat
                                                                           180
                                                                           240=
                                                                           300
natatatgtc aatcngattt aagatacaaa acagatccta tggtacatan catcntgtag
gagttgtggc tttatgttta ctgaaagtca atgcagttcc tgtacaaaga gatggccgta
                                                                           360
agcattctag tacctctact coatggttas gastcgtaca cttstgttta catatgtnca
                                                                           420
gggtaagaat tgtgttaagt naanttatgg agaggtccan gagaaaaatt tgatncaa
       <210> 199
       <211> 482
       <212> DNA
       <213> Homo sapièn
       <220>
       <221> misc_feature
       <222> (1) ... (482)
       \langle 223 \rangle n = A,T,C or G
       <400> 199
 agtgacttgt cotocaacaa aacccettga tcaagtttgt ggcactgaca atcagaccta .
                                                                            60
 tgctagttcc tgtcatctat tcgctactaa atgcagactg gaggggacca aaaaggggca
                                                                           120
 traactorag otggattatt tiggagootg caaatotatt cotactigta oggactitga
                                                                           180
                                                                           240
 agtgatteag ttteetetae ggatgagaga etggeteaag aatateetea tgeagettta
                                                                           300
 tgaageenae tetgaacaeg etggttatet nagatgagaa neagagaaat aaagtemaga
 seatttacct ggangasaag aggetttngg etggggacca teccattgas eettetetta
                                                                           360
                                                                           420
 anggaettta agaanaaaet accaeatgin tgingtatee iggigeengg cogittanig
                                                                           480
 aachingach heacectini ggaatahani etigaengen teetgaaett geteeteige
                                                                           482
       c210> 200
       <211> 270
       <212> DNA
       <213> Bomo Bapien
       <220>
       <221> misc feature
       c222> (1) ... (270)
       <223> n = A, T, C or G
```

```
<400> 200
eggeogcaag tgraacteca getggggeeg tgeggaegaa gattetgeea geagttggtt
                                                                          60
cgactgcgac gacggcggcg gcgacagtog caggtgcagc gogggcgcct ggggtcttgc
                                                                         120
aaggotgago tgaogoogoa gaggtogtgt cacgtoccac gaccttgaog cogtogggga
                                                                         180
cedecadeec valedccoder averacates attactedada edaccartada avetadaca
                                                                         240
cogagagata epezggtgca ggtggccgcc
                                                                         270
      <210> 201
      <211> 419
      <212> DNA
      <213> Romo sapien
      <220>
      <221> misc_feature
      <222> (1)...(419)
      c223> n = A, T, C or G
      <400> 201
tttttttttt ttttggaate taetgegage acageaggte ageaacaagt ttattttgea
                                                                         60
gctagcaagg taacagggta gggcatggtt acatgttcag gtcaacttcc tttgtcgtgg
                                                                        120
tigatiggit igiciltaig ggggcggggi ggggtagggg aaanogaagc anaantaaca
                                                                        180
tegagteggt geaccetece tetagaacet egttacnaaa gettegeegea etteaceteg
                                                                        240
tetgtgaccg teattteett gacateaatg ttattagaag teaggatate ttttagagag
                                                                        300
tecactgint ciggagggag attagggitt citgecaana tecaancaaa atceacniga
                                                                        360
assayttyya tyatnoanyt acnysataco yangyostan tectoatant oyytyyoo
                                                                        419
      <210> 202
      <211> 509
      <212> DNA
      <213 > Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (509)
      \langle 223 \rangle n = A,T,C or G
      <400> 202
tientitit tittettit tettettit tittitiet bittitiet tittette
                                                                         60
tggcacttaa tocatttta tttcaaaatg tctacaaant ttnaatnomo cattatacng
                                                                        120
gtnattttnc aaaatctaaa nnttattcaa atntnagcca aanteettac neaaatnnaa
                                                                        180
tacmenessa satesaasat atsentotet ttesgessae ttngttaest saattaassa
                                                                        240
satatatacg griggigiti trasagtars attatrites carigrasar aintiinnas
                                                                        300
ggaactamaa taaaaaaaaa cactneegem aaggttamag ggmmeamea attenttttm
                                                                        36 D
caacancence nattataaaa atcatatete aaatettagg ggaatatata etteacaceg
                                                                        420
ggatottaad tittaeinea etitgittat tittiianaa edattginti gggeedada
                                                                        480
caatggnaat necreenene tggactagt
                                                                        509
      <210> 203
      <211> 583
      <212> DNA
      <213> Homo sapien
     <220>
      <221> misc_feature
      <222> {1)...(583)
     \langle 223 \rangle n = A,T,C or G
```

```
<400> 203
ttttttttt tttttttgs coccectett ataaaaaaca agttaccatt ttatttact
                                                                         60
tacacatatt tattttataa tiggtattag atattcaaaa ggcagctitt aaaatcaaac
                                                                        120
tasatggasa etgeettaga tacataatte ttaggaatta gettaaaate tgeetaaagt
                                                                        180
gasestette totagotett tigactytas attitigaet etigiassac atcomatic
                                                                        240
attiticity tottlasset teloteatot ticcattiti tocciatice sagiceatit.
                                                                        300
gettetetag ceteatttee tagetettat etactattag taagtggett titteetaaa
                                                                        350
agggaaaaca ggaagagana atggcacaca aaacaaacat tttatattca tatttctacc
                                                                        42D
tacgitaata aaatagcatt tigigaagee ageteaaaag aaggettaga teetittatg
                                                                        480
tecattttag teactamacy atatenamag tgccagaatg cammaggett gtgameattt
                                                                        540
attomango taatetsaga tatttoscat actoatottt otg
      <210> 204
      <211> 589
      c212> DNA
      <213> Homo eapien
      <220>
      <221> misc_feature
      <222> (1) ... (589)
      \langle 2223 \rangle n = A,T,C or G
      <400> 204
tittititit tittititit tittitincic tictititit tiganaatga ggatcyagti
                                                                         60
tttcactctc tagatagggc atgaagaaaa ctcatctttc cagctttaaa ataacaatca
                                                                        12D
astetettat getatateat attitaagtt aasetastga giesetgget tatettetee
tgaaggaaat ctgttcattc ttctcattca tatagttata tcaagtacta ccttgcatat
                                                                        240
                                                                        30D
tgagaggttt ttottotota tttacacata tatttocatg tgaatttgta toasacottt
attiteatge asactagana stasiginit ettitgesta agagaagaga sesatsinag
                                                                        360
cattacasaa ctgctcaaat tgtttgttaa gnttatccat tataattagt tnggcaggag
                                                                        420
                                                                        480
ctaatacaaa tcacatttac ngacnagcaa taataaaact gaagtaccag ttaaatatcc
assataatta aaggaacatt titageetgg gtataattag etaatteact tiacaageat
                                                                        540
ttattnagaa tgaattcaca tgttattatt contagocca acacaatgg
                                                                        589
      <210> 205
      <211> 545
      <212> DNA
      <213> Homo sapien
      <220>
      c221> misc feature
      <222> (1) ... (545)
      \langle 223 \rangle n = A,T,C or G
      <400> 205
tittintitt titticagt estastoaga soastatita tittistati taasattoat
                                                                         60
agasaagtgc cttacattta atsaasgttt gtttctcaaa gtgstcagag gaattagata
                                                                        120
tngtottgaa caccaatatt aatttgagga aaatacacca aaatacatta agtaaattat
                                                                        180
traagateat agageregta agtgaaaaga taaaatttga eercagaaae tetgageatt
                                                                        240
asaaateeae tattageaaa taaattaeta tggaettett getttaattt tgtgatgaat
                                                                        300
atggggtgte actggtaaac caacacatte tgaaggatac attacttagt gatagattet
                                                                        360
tatgtacttt getamatnac gtggatatga gttgacaagt ttetetttet teaatetttt
                                                                        420
                                                                        480
aaggggenga ngaaatgagg aagaaasgas aaggattacg catactgtte tttctatngg
eaggattage telgiticci tigcceatet teaaaaaaeta etaatgitte ciectegige
                                                                        $40
Baccc
```

<210> 206 <211> 487

```
<212> DNA
       <213> Homo sapien
      <220>
       <221> misc_feature
       <222> (1) ... (487)
       \langle 223 \rangle n = A,T,C or G \cdot
      <400> 206
ttttttttt ttttttagte aagtttetna tttttattat aattaaagte ttggteattt
                                                                         6 D
cattlattag ctctgcaact tacatattta aattaaagaa acgttnttag acaactgtna
                                                                        120
caatttataa atgtaaggtg ccattattga gtanatatat tootocaaga gtggatgtgt
                                                                        180
ccettetece accaactaat gaaneageaa cattagttta attttattag tagatmatae
                                                                        240
actgotycza acyctaatto tottotocat coccatytny atattytyta tatytytyan
                                                                        300
tigginagaa tgcatcanca atcinacsat caacagcaag atgaagciag genigggeti
                                                                        360
teggigamaa tagacigigi eigielgaat caaalgalei gaeetaleet eggiggeaag
                                                                        420
aactottoga acceptitoot caaaggongo igocacatti giggonicin tigcactigi
                                                                        480
ttcaaaa
                                                                        487
      <210> 207
      <211> 332
      <212> DNA
      <213> Homo sapień
      <220>
      <221> misc_feature
      <222> (1) . . . (332)
      <223> n = A, T, C or G
      <400> 207
tgaattgget aaaagactge atttttamaa etageaacte ttatttettt eetttaaaaa
                                                                         60
tacatagoat taaateecaa ateetattta aagaeetgae agettgagaa ggteaetaet
                                                                        120
geathtatag gaccthetgg tggthetget ghtachtttg aantetgaes atenttgana
                                                                        180
atctttgcat gcagaggagg taaaaggtat tggattttca cagaggaana acacagcgca
                                                                        240
gazatgaagg ggccaggctt actgagcttg tecactggag ggctcatggg tgggacatgg
                                                                        300
aaaagaaggc agcctaggcc ctggggagcc ca
                                                                        332
      <210> 208
      <211> 524
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(524)
      <223> n = A, T, C or G
      <4QD> 208
agggcgtggt gcggagggcg ttactgtttt gtctcagtaa caataaatac aaaaagactg
                                                                        60
gttgtgttcc ggccccatcc aaccacgaag ttgatttctc ttgtgtgcag agtgactgat
                                                                       120
tttmaaggac atggagettg temesatgte meantgteme agtgtgaagg gemeatteme
                                                                       180
tecogegigs ticocattia geoscesses stagetesty agreeatest tytesalact
                                                                       240
titggcagaa tactinitga aacitgcaga tgataactaa gatccaagat atticcaaa
                                                                       300
gtaastagaa gtgggtcats atattaatta cetgttesea teagettera tttacaagte
                                                                       360
atgageceag acaetgaeat casaetaage coaettagae teeteaceae cagtetgtee
                                                                       420
tyteateaga caggaggety teacettgae caaattetea ceagteaate atetateeaa
                                                                       480
adaccattac ctgatccact tccggtaatg caccaccttg gtga-
                                                                       524
```

```
<210> 209
       <211> 159
       <212> DNA
       <213> Homo sapien
       <400> 209
 gggtgaggaa atccagagtt gccatggaga aaattccagt gtcagcattc ttgctccttg
 tggccctctc ctacactctg gccagagata ccacagtcaa acctggagcc aaaaaggaca
                                                                        120
 caaaggacte tegacceaaa etgeeccaga eceteteca
                                                                        159
       <210> 210
       <211> 256
       <212> DNA
       <213> Homo sapien
       <22D>
       <221> misc feature
       <222> (1) ... (256)
       <223> n - A,T,C or G
       <400> 21D
actocotogo agadaaaggo agaggagaga-gototgttag ttotgtgttg ttgaactgoo
                                                                        120
 actgeattte titecactty gactattaca tyccentige gygaetaety geseascyte
 tggggagatt ttanccaatt tangtnigta aatggggaga ciggggcagg cgggagagat
                                                                        180
 ttgcagggtg naaatgggan ggctggtttg ttanatgaac agggacatag gaggtaggca
                                                                         24D
                                                                         256
 ccaggatget sastca
       <210> 211
       <211> 264
       <212> DNA
       <213> Homo sapien
       <220×
        <221> misc feature
       <222> {1}...(264)
       <2235 n - A,T,C or G
        <400> 211
 acattgtttt tttgagataa agcattgaga gageteteet taaogtgaea caatggaagg
                                                                          бD
 actggaacac atacceacat ctttgttctg agggataatt ttctgataaa gtcttgctgt
                                                                         120
 atatteage acatatgita tatattatte agttecatgt ttatageeta gttaaggaga
                                                                         160
 ggggagatac attongaaag aggactgaaa gaaatactca agtnggaaaa cagaaaaaga
                                                                         240
                                                                         264
 aaaaaaggag caaatgagaa gcct
        <210> 212
        <211> 328
        <212> DNA
        <213> Home sapien
        <220>
        <221> misc_feature
        <222> (1).,.(328)
        <223> n - A,T,C or G
       <400> 212
                                                                          60
  accessassit cesatgetgs stattigget testiative canattetti gattgicass
                                                                         120
 ggatttaatg tigicicago tigggracti cagitaggac ctaaggatge cagecggeag
 gtttatatat gcagcaacaa tattcaagcg cgacaacagg ttattgaact tgcccgccag
                                                                         180
```

```
tineattica ticccatiga ciigggaico tiatomicag congagagai igaaaattia
                                                                         240
 cccctacnae tetttactet ctgganaggg ccagtggtgg tagetataag cttggccaea
                                                                         300
 ttttttttc ctttattcct ttgtcaga
                                                                         32R
       <210> 213
       <211> 250
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       c2225 (1)...(250)
       <223> n - A,T,C or G
       <400> 213
 acttatgage agagegacet atconagtgt agactgaata aaactgaatt ctotecagtt
                                                                          60
 tamagcattg ctcactgaag ggatagaagt gactgccagg agggamagtm agccmaggct
                                                                        120
 cattatgoca aagganatat acatttcaat totocaaact tottocteat tocaagagtt
                                                                        180
 ttematattt gentgameet getgatmane entgttmane macmantate tetetmacet
                                                                        240
 teteateggt
                                                                        250
       <210<sub>2</sub> 214
       <211> 444
       <212> DNA
       <213> Homo sapien
       <220×
      <221> misc_feature
       <222> (1)...(444)
      <223> n = A,T,C or G
      <400> 214
accompante cantgetgan tatttggett cattatteec agattetttg attgteanag
                                                                         БÔ
gatttaatgt tetrteaget teggecactte agttaggace taaggateee ageeggeagg
                                                                        120
tttatatatg cagcaacaat attcaagcgc gacaacaggt tattgaactt gcccgccagt
                                                                        180
tgaatttcat teccattgae ttgggateet tateateage canagagatt gaaaatttae
                                                                        240
ecctacgaet etttactete tggagaggge cagtggtggt agetataage ttggccacat
                                                                        300
Ettettecc titaticcit igicagagat grgaticato catalgotan aascqaqaq
                                                                        360
agigacitti acaaaattcc talagamatt gigaataaaa ccitacctal agiigccali
                                                                        420
actitgetet ecctaatata ecte
      <210> 215
      <211> 366
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(366)
      <233> n = A, T, C or G
      <400× 215
acttatgage agagegaeat atecaagtgt anactgaata anactgaatt etetecagtt
tabagcattg ctcactgaag gyatagaagt gactgccagg agggaaagta agccaagget
                                                                       120
cattatgcca aagganatat acatttcaat totocasact tottoctcat tocaagagtt
                                                                    180
ttcaatattt gcatgaacot gotgataago catgttgaga aacaaatato tototgacot
                                                                       24D
totoatoggt aagoagaggo tgtaggoaac atggaccata gogaanaaaa aacttagtaa --- 300
tecaagetgt tttetacart gtaaceaggt ttecaaceaa ggtggaaate tectataett
```

```
366
ggtgcc
      <210> 216
      <211> 260
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (260)
      <223> n = A,T,C or G
      <400> 216
ctgtataaac agaactccac tgcangaggg agggcogggc caggagaatc tccgcttgtc
caagacaggg gcctaaggag ggtctccaca ctgctnntaa gggctnttnc attttttat
                                                                       120
teateaaaag tunaaaaggo otottotoaa otettiticoo tinggotgga aaattaaaa
                                                                       180
atcasasstt tootnaagtt nicaagotat catatatact niacootgaa aaagoaacat
                                                                       240
                                                                       260
aattottoot tooctoottt
      <210> 217
      <211> 262
      5212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...(262)
      c223> n - A,T,C or G
      c400> 217
acctacgigg gtaagtitam aaatgttata atticaggaa naggaacgoa tataatigta
tettgeetat aattitetat titaataagg aaatageasa tiggggtggg gggsaigtsg
                                                                       120
gecattotac agettgagoa asatgoaatt aaatgegaa ggacagoact gaaaaatttt
                                                                       180
atgaztaate tgtatgatta tatgteteta gagtagattt ataattagee aettaeeeta
                                                                       240
                                                                       262
atateettes teettetas et
      <210> 218
      <211> 205
      <212> DNA
      <211> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (205)
      <223> n = A, T, C or G
accaegging ignatiaccy geenigate aangececce icgingcees coccineged
                                                                        60
contratesa etecettitg tagtaaacti ggaacettgg saatgaccag gerasgacte
                                                                       120
aggeeteece agttetactg acctttgtee ttangtntna ngtecagggt tgetaggasa
                                                                       180
                                                                       205
anaaatdage agacacaggt gtaaa
      <210> 219
      <211> 114
      <212> DNA
     ....<213> Homo sapien -----
      <400> 219
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tactatttt totcagtaac aataaataca aaaagactag tlatgttccg gccccatcca	60
accacqaagt tgatttctct tgtgtgcaga gtgactgatt ttaaaggaca tgga	114
<210> 220	
<211> 93	
<212> DNA	
<213> Homo sapien	
<40D> 22D	
actagocago acaaaaggoa gggtagootg aattgottto tgototttac atttotttta	БÒ
aaataageat thagtgetea greectactg agt	93
040 400	
<210> 221	
<211> 167 <212> DNA	
<213 > Homo sapien	
<220>	
<221> misc feature	
<222> (1)(167)	
<223> n = A,T,C or G	
4113 11 - X11,4 DE G	
<40D> 221	
actanginga ggingegeaca aatattigic gatatteeet teatetigga ticeatgagg	60
tettttgece ageetgtgge tetactgtag taagtttetg etgatgagga geeagnatge	73 <b>0</b>
CCCCCactac cttccctgac gctccccana aatcacccaa cctctgt	167
	107
<210> 222	•
<211> 351	•
<212> DNA	
<213> Homo sapien	
<400> 222	
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gttettence tgteeecaa teettaaaag geentactge ataaagteaa caacagataa	120
atgittgcig aattaaagga iggatgaaaa aaattaataa igaattiitig cataatccaa	180
ttttctcttt tatatttcta gaagaagttt ctttgagcct attagatccc gggaatcttt	240
taggtgagca tgattagaga gettgtaggt tgettttaea tatatetgge atatttgagt	300
ctcqtalcaa aacaategat tggtaaaggt ggtattattg tattgataag t	351
<210> 223	
<211> 383	
<212> DNA	
c213> Homo sapien	
<220>	1.0
<221> misc_feature	
<222> (1)(383)	
<223> n = A, T, C or G	
2233 H = R, I, C DE G	
<400> 223	
aaaacaaaca aacaaaaaa acaattotto attoagaaaa attatottag ggactgatat	
tggtaattat ggtcaattta atwrtretkt ggggcattte ettacattgt ettgacaaga	6D
ttaaaatgte tgtgccaaaa tittgtaitt tatitggaga ettetiatea aaagtaatge	120
tgcceaagga agicta gga attagiagig ticcomtcac tigitiggag tgigotatic	180
LAASAGATEE tgatttcctg gaatgacaat tatattttaa cettggtggg ggsaanagtt	340 300
ataggaccac agtottoact totgatactt gtaaattaat ottttattgo acttqttttg	~~ 360~~
accattaage tatatetta aaa	383
w minimage is a minimage of the control of the cont	

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```
<210> 224
      <211> 320
      <212> DNA
      <2135 Romo sapien
      4400> 224
                                                                       60
cocctgaagg citcitgita gaaaatagta cagitacaac caataggaac aacaaaaaga
aaaagttigi gacaligtag tagggagigi gtaccoctta ciccccatca aaaaaaaaa
                                                                       120
ggatacatgg ttamaggata raagggcaat ettttetcat atgitciasa agagaaggaa
                                                                      180
gagasaatac tactttctcr aastggaagc ccttaaaggt gctttgatac tgaaggacac
                                                                      240
aaatgtggcc gtccatcctc ctttaragtt gcatgacttg gacacggtaa ctgttgcagt
                                                                      300
                                                                       320
tttaractom gcattgtgac
      <210> 225
      <211> 1214
      <212> DNA
      <213> Homo sapien
      <400> 225
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                                                                       60
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                                                                       120
aactoctaca coatcogget gggcotgcac agtottgagg cogaccaaga gecagggage
                                                                       180
cagatggtgg aggecagect etcegtacgg cacceagagt acaacagace ettgeteget
                                                                       24 D
aacgacctea tgetcatcaa gttggacgaa teegtgteeg agtetgacae cateeggage
                                                                       30D
atcagoatty officeagty coofacegry 999aacteff 900fcglife tggofggggt
                                                                       360
ctgctggcga acggcagaat gcctaccgtg ctgcagtgcg tgaacgtgtc ggtggtgtct
                                                                       420
gaggaggtot gcagtaagot ctatgaccog ctgtaccaco ccagcatgtt ctgcgccggc
                                                                       480
ggagggcaag accagaagga ctectgcaac ggtgactetg gggggcccct gatetgcaac
                                                                       540
gggtacttgc agggccttgt gtctttcgga aaagccccgt gtggccaagt tggcgtgcca
                                                                       600
                                                                     · 660
ggtgtotaca ccaacctotg caaattoact gagtggatag agaaaaccgt ccaggccagt
taactotggg gactgggaac ccatgaaatt gaccoccaaa tacatootgo ggaaggaatt
                                                                       720
caggaatate tyttmecage emetecteed teaggeneag gagtmeagge coemagence
                                                                       780
tentenntea ascrangggt acagatence agreectent contragace caggagtera
                                                                       R40
gacccccag coectcetec etcagaccca ggagtecage coetcetece teagacccag
                                                                       900
gagtocagae cocceagece etectrocte agacceaggg gteraggere craaccerte
                                                                       960
ctroctcaga ctcagaggte caageceeca acceeteett ecceagacee agaggtecag
                                                                      1020
gtrccagece etectecete agacceageg gtecaatgee acctagaete tecetgtaca
                                                                      1080
cagtgorcce ttgtggcarg ttgacccaac cttaccagit ggtttttcat tttttgtccc
                                                                      1140
                                                                      1200
ttteccetag atceagaaat aaagtetaag agaagegeaa aaaaaaaaa aaaaaaaa
                                                                      1214
EBBB ESSACASSOS
       <210> 226
       <211> 119
       <2125 DNA
       <213> Homo sapien
       <400> 226
                                                                        60
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agaacctggc ccagtcataa tcattcatcc tgacagtggc aataatcacg ataaccagt
                                                                       119
       <210> 227
       <211> B18
       <212 > DNA
       <213> Homo sapiem
    <400> 237
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acaatteata gggaegacca atgaggacag ggaatgaace eggeteteee ecageeetga

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                                                                        120
acggacggit citageacan titgigabat cigigiaraa cegggettig caggggagat
                                                                        180
aattttooto ototggagga aaggtggtga ttgacaggca gggagacagt gacaaggcta
                                                                        240
gagaaagcca cgcteggeet tetetgaacc aggatggaac ggcagacccc tgaaaaogaa
                                                                        300
schistore trecaateas ceachtersa saacceceat chaachtech achssaaas
                                                                        360
agggcctcct caggagcagt ccaagagttt tcaaagataa cgtgacaact accatctaga
                                                                        420
ggaaagggtg caccotcagc agagaagccg agagcttaac totggtogtt tocagagaca
                                                                        480
acctgotgge tgtettgggå tgegereage etttgagagg coactaccec atgaacttet
                                                                        540
gocatocact ggacatgaag otgaggacac tgggottcaa cactgagttg tcatgagagg
                                                                        600
gacaggetet geodteaage eggetgaggg cageaaccae tetecteece ttteteaege
                                                                        660
assignatio comessated agadestace atgasgrass gagaderass captitigget
                                                                        720
caagaggata tgaggactgt ctcagcctgg ctttgggctg acaccatgca cacacacaag
                                                                        780
gtccacttcf aggttttcag cctagatggg agtcgtgt
                                                                        818
      <210> 228
      c211> 746
      <212> DWA
      <213> Homo sapien
      <400> 228
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                                                                         60
greatgacgt trgacatace rriggaaoga geeteeteet rggaagatgg aagacogret
                                                                        130
tegtegeega eetggeetet eetggeetgt ttettaagat geggagteae attteaatgg
                                                                        180
taggaaaagt ggcttcgtaa aatagaagag cagtcactgt ggaactacca aatggcgaga
                                                                        240
tgctoggtgc acattggggt gctttgggat aaaagattta tgagccaact attctctggc
                                                                        300
accapattot aggocapttt gttocactga agottttocc acagoagtoc acctetgeag
                                                                        360
griggraget gastggritg crygiggetr tgtggraags tearactgag ategatgggt
                                                                        420
gagaaggeta ggatgettgt etagtgttet tagetgteae gttggeteet teeaggttgg
                                                                        480
ccagacggtg ttggccactc ccttctaaaa cacaggcgcc ctcctggtga cagtgacccg
                                                                        540
cogtograty cottogecca biccapcagt cocaptiats catitoaagt tigggetite
                                                                        600
ttettttegt taatgiteet eigigtigte ageigtette atticetggg etaageagea
                                                                       660
ttgggagatg tggaccagag atccactect taagaaccag tggcgaaaga cactttcttt
                                                                       72D
cttcactctg aagtagctgg tggt
                                                                       744
      <210> 229
      <211> 300
      <212> DNA
      <213> Homo sapien
      <400> 229
egagtetggg ttttgtctaf aaagtttgat coctcettt eteateesaa teatgtgaae
                                                                        60
cattacacat cgaaataaaa gaaaggtggc agacttgccc aacgccaggc tgacatgtgc
                                                                       120
tgcagggttg ttgtttttta attattattg ttagaaaogt caccacagt coctgttaat
                                                                       180
tigtatgiga cagocaacto tgagaaggic otattitico accigoagag gatocagici
                                                                       240
cactaggete etectigece teacactgga gtetecgeca gtgtgggtge ceactgacat
                                                                       300
      c210> 230
      <211> 301
      <212> DNA
      <213> Bomo mapien
      <400> 230
cagcagaaca aatacaaata tgaagagtgc aaagatctca taaaatctat gctgaggaat
                                                                        60
gagegacagt temaggagga gmagettgem gagemgetem agemmgetgm ggmgetemagg
                                                                       120
castatasag teetgettes cacteaggas egagagetga eccagttasg ggagaagttg
                                                                       180
ogggaaggga gagabgooto cototoattg aatgagcato tocaggooot cotcactoog
                                                                       240
gatgaaccgg acaagteera gggg684g84c etecaagaaa cagacetegg cegegaceae
                                                                       300
                                                                       301
Ť
```

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<210> 231
      <211> 301
      <212> DNA
      <213> Homo sapien
      <4QD> 231
geaageaege tggeaaatet etgteaggte ageteeagag aageeattag teattttage
                                                                        БQ
caggaactee aagteeacat cettggeaac tggggaettg egeaggttag cettgaggat
                                                                        120
ggcaacacgg gactteteat cagpaagtgg gatgtagatg agetgatcaa gacggecagg
                                                                        160
totgaggatg graggatcaa tgatgtragg coggttggta cogccaatga tgaaracatt
                                                                        240
tttttttgtg gacatgccat coatttctgt caggatctgg ttgatgactc ggtcagcagc
                                                                       3 D Q
                                                                        tof
      <210> 232
      <211> 301
      <212 > DNA
      <2135 Homo sapien
      <400> 232
agtaggtatt tegtgagang ttemacacca amactggmac atagttetee ttemagtgtt
                                                                        60
ggcgacagcg gggcttcctg attctggaat atactftgt gtaaattaac agccacctat
                                                                       120
agaagagtee atetgetgtg aaggagagae agagaaetet gggtteegte gteetgteea
                                                                        180
ogtgobgtae caagigoigs byccascoby traccigito boacbsaasa tolggobaat
                                                                       240
getettigtigt ateaettetg attetgacaa teaateaate aatggeetag ageaetgact
                                                                        300
                                                                       301
      <210> 233
      <211> 301
      <212> DNA
      <213> Homo sapien
      <40D> 233
atgactgact teccagtaag getetetaag gggtaagtag gaggateeac aggatttgag
                                                                        60
atgetaagge cecagagate gtttgateea accelettat tttcagaggg gaaaatgggg
                                                                       12D
cetagaagtt acagageate tagetogtoc getogeacce etogeeteac acagaetece
                                                                       180
gagtagetgg gactacagge acacagtese tgsagcagge cetgttagea attetatgeg
                                                                       240
tacaaattaa catgagatga gtagagactt tattgagaaa gcaagagaaa atcctatcaa
                                                                       300
                                                                       301
      <210> 234
      <211> 301
      <212> DNA
      <213> Homo gapien
      <400> 234
agginotaca calogagact calcoatgat igalatgaat itaaaaatta caagbaaaga
                                                                        δD
cattleatte ateatgatge terestitgt treaterest egenteette tittlettit
                                                                       120
tcaatttcag cascatactt ctcaatttct tcaggattta aaatcttgag ggattgatct
                                                                       180
egecteatga cageaagtte aatgtttttg coacetgaet gaaccaette caggagtgoo
                                                                       240
ttgatcacca gettaatggt cagateatet getteaatgg ettegteagt atagteette
                                                                       300
                                                                       301
      <210> 235
      <211> 283
      <212> DNA
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<213> Romo sapien

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<400> 235
 tggggctgtg catcaggogg gtttgagaaa tattcaattc tcagcagaag ccagaatttg
                                                                          бΰ
 aatteeetea tettttaggg aateatttae caggtttgga gaggatteag acageteagg
                                                                          120
 tgettteact aatgtetetg aacttetgte ectettegte categatagt ecaataaata
                                                                          180
atgitalcti igaactgaig cicataggag agaatataag aactcigagi gatalcaaca
                                                                         240
 ttagggatto maagamatat tagatttaag otoacactgg toa
                                                                         283
       <210> 236
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 236
aggiorica coaacigodi gaagcacggi taaaatiggg aagaagtata gigcagcata
astactitia astogatoag atticoctaa cocacaigos atcitotica coagaagagg
                                                                         120
toggageage atcattaata ceaageagaa tgegtaatag ataaataeaa tggtatatag
                                                                         180
taggtagaca acticatgas tarastatas tatagtates tastetagas tigggtigta
                                                                         240
aagcatcgtg taccagtcag aaagcatcaa tactcgacat gaacgaatat aaagaacacc
                                                                         300 -
                                                                         302
       <210> 237
       <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 237
cagtegitagi ggiggiggad giggdgitigg togiggigdd tillitggig codgidadaa
actoratett tettegetee tttttegeet ttteerattt gteerteten attttetgeg
                                                                         120
ccleggetaa tgcctcatag taggagteet cagaccagec atggggatca aacatateet
                                                                         180
tigggtagtt ggtgccaage tegtcaatgg cacagaatgg atcagettet egtaaateta
                                                                         240
gggfteegaa attetttett eetttggata atgtagttea tateeattee eteetttate
                                                                         300
      <210> 238
      <211> 301
      <212> DNA
      <213> Homo sapien
      <4Q0> 238
gggcaggttt ttttttttt tttttgatg gtgcagaccc ttgcttatt tgtctgactt
                                                                          60
gttcacagtt cagccccctg ctcagaaaac caacgggcca gctaaggaga ggaggaggca
                                                                         120
ecttgagaet teeggagteg aggeteteea gggtteecea geccateaat cattttetge
                                                                         180
accecutyce tyggaagcay etecetyggg gytgggaatg gytgactaga agggatttca
                                                                        240
gigiggacc cagggicigt tetteacagt aggaggigga agggatgact aattictita
                                                                        300
                                                                        301
      <210> 239
      <211> 239
      <212> DNA
      <213> Homo sapien
      <400> 239
ataagcaget agggaattet ttatttagta atgteetaac ataaaagtte acataactge
                                                                         60
ttetgteaaa ceatgatact gagetttgfg acaacccaga aataactaag agaaggcaaa
                                                                        120
cataatacet tagagatesa gaaacattta escagttesa etgtttaasa atagetesac
                                                                        180
attcagccag tgagtagagt gtgaatgcca gcatacarag tatacaggtc cttcaggga
       ر .
د چو مصودهدددد پرهوانو و چود چی . د . چود و . د . د . د .
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<211> 300
        <212> DNA
        <213> Homo sapien
        c400> 240
 ggtcctmatg amgcmgcmgc ttccacmttt tamcgcaggt ttacggtgat actgtccttt
 gggatrigco otocagigga accittitaag gaagaagigg goocaagcia agitocacat
                                                                         130
 gctgggtgag ccagatgact tetgtteeet ggtcacttte tteaatgggg cgaatgggg
                                                                         180
 ctgccaggtt tttaaaatca tgcttcatct tgaagcacac ggtcacttca ccctcctcac
                                                                         240
 gotgtgggtg tactttgatg assatacoca otttgttggc otttotgaag otataatgto
                                                                         300
        <310> 241
        <211> 301
       <212> DNA
       <213> Homo sagien
       <400> 241
 gaggtetggt getgaggtet etgggetagg aagaggagtt etgtggaget ggaagccaga
                                                                         60
 cctctttgga ggaaactcca gcagctatgt tggtgtctct gagggaatgc aacaaggetg
                                                                        120
 proceeding tartegaaaa orgonaacte gactonacte ganggangie orgotecong
                                                                        180
 tgtgaagaac cagcetgagg tgacagaaac ggaagcaaac aggaacagcc agtettttet
                                                                        240
 tectrotect gtestaeggt-cteteteaag-catecttgt-tgteagggge-ctasaaggga-
                                                                        -300
                                                                        301
       <210> 242
       <211> 301
       <212> DNA
       <213> Homo sapien
       <4005 242
 cogaggicet gggatgeaac caateactet gitteacgig actitiatea ceatacaatt
                                                                         50
 tgtggcattt ceteatttte tacattgtag aatcaagagt gtaaataaat gtatategat
                                                                        120
 gtettesaga atstatestt cetttttese tagsaceest tesasatata agtesagast
                                                                        180
 ctteatere acaatatat caagcaaect ggaaggcaga ataactecce taatttagta
                                                                        240
 taagtaceea aagtittata aateaaaage eetaatgata aecattitta gaatteaate
                                                                        300
                                                                        301
       <210> 243
       <211> 301
       <212> DNA
       <213> Komo sapien
       <400> 243
aggtaagtee cagtttgaag etcaaaagat etggtatgag cataggetea tegacgacat
                                                                         60
ggtggcccaa gctatgaaat cagagggagg cttcatctgg gcctgtaaaa actatgatgg
                                                                        120
tgacgtgcag tcggactetg tggcccaagg gtatggctct ctcggcatga tgaccagogt
                                                                        180
gotggtttgt ccagatggca agacagtaga agcagaggct gcccacggga ctgtaacccg
                                                                        240
teactacege atgitecaga anggacagga gacgiccace mateccattg ettecattit
                                                                        300
                                                                        301
      c210> 244
      c213> 300
       <212> DNA
      <213> Homo aapien
      <400> 244
griggitige aagaatgasa igaatgatir taragriagg arttaarcti gaaatggasa
                                                                        60
gtcatgcaat cocattigca ggatctgtct gtgcacatgc ctctgtagag agcagcattc
                                                                       120
```

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ccagggacct tggaaacagt tgacactgta aggtgettge teeccaagae acatectaaa
                                                                        18 n
aggigitgia aiggigaaaa ogicticott cittatigoo cottottati taigigaaca
                                                                        240
actytttyte tittytytat etittitaaa etytaasytt esattytysa aatyastate
                                                                       300
       <210> 245:
       <211> 301
       <212> DNA
       <213> Homo sapien
       c400> 245
gtotgagtat ttaaaatgtt attgaaatta tooocaacca atgttagaaa agaaaqaggt
tatatactta gataaaaaat gaggtgaatt actatecatt gaaateatge tettagaatt
                                                                       120
aaggecagga gatattgtea ttaatgtara etteaggaea etagagtata geagecetat
                                                                       180
gttttcaaag agcagagatg caattaaata Etgtttagca tcaaaaaggc cactcaatac
                                                                       240
agctaataaa atgaaagacc taatttctaa agcaattctt tataatttac aaagtttaa
                                                                       300
                                                                       101
      <210> 246
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 246
ggtetgteet acaatgeetg ettettgaaa gaagteggea etttetagaa tagetaaata
                                                                        60
acctoggett attitaaaga actatitgia geteagatig giitteetai geetaaaata
                                                                       120
agtgcttctt gtgasaatta aataasscag ttaattcasa gccttgatat atgttaccac
                                                                       180
taacaatcat actaaatata tiitgaagta caaagtiiga catgototaa agigacaaco
                                                                       240
caaatgbgto btacaaaaca ogttootaac aaggtatgot btacactacc aatgcagaaa
                                                                       300
                                                                       301
      <210> 247
      <211> 301
      <212> DNA
      <213> Homo sapien
      c400> 247
aggirctitg gragggrica iggaicagag cicasacigg agggasagge atticgggia
                                                                        6 D
gootaagagg gogactggcg geagcacaac caaggaaggc aaggttgttt cccccacget
                                                                       120
statectate tteagatges acacacaate eteatgasaa cassateace catgesetge
                                                                       160
cottgatgat caaggitggg gottaagtgg attaagggag gcaagttotg ggttoottgo
                                                                       240
cttttcasac catgaagtca ggctctgtat ccctcctttt cctaactgat attctaacta
                                                                       300
                                                                       301
      <210> 248
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 248
aggiostigg agaigceath beageegaag gastettetw tieggaagta casseteach
attaggaaga ttcttagggg taatttttct gaggaaggag aactagccaa cttaagaatt
                                                                      120
acaggaagaa agtggtttgg aagacagcca aagaaataaa agcagattaa attgtatcag
                                                                      180
gtacattcca gootgttggc aactocataa aaacatttca gattttaatc cogaatttag
ctaatgagac tggatttttg ttttttatgt tgtgtgtcgc agagetaaaa actcagttcc ....300
```

<210> 249 <211> 301

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<212> DNA
      <213 > Homo capien
      <400> 249
gtecagagga agcacotggt gotgaactag gottgecotg otgtgaactt gcacttggag
                                                                        60
contgacgot getgtteten cogaaaaaec ogsoogsoot cogogatoto ogtooogees
                                                                       12D
ocagggagac acageagtga cteagagetg gtegracact gtgesteest ceteacegee
                                                                       180
categuate aattattite aaaattaatt ceaceateet ticagattet ggatggaaag
                                                                       240
actgaatett tgacteagaa ttgtttgetg aaaagaatga tgtgacttte ttagteattt
                                                                       300
                                                                       301
      <210> 250
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 250
egtotetgae asgeactige aggotetegg aggosagtes coottaacac tacacticic
                                                                        60
cttatctta tiggetigat aaacataatt attictaaca ctagettatt tecagitigee
                                                                       120
cataagcaca toagtacttt tototogoto gaatagtaaa otaaagtato gtacatotac
                                                                       190
ctaaaagact actatgtgga ataatacata ctaatgaagt attacatgat ttaaagacta
                                                                       240
Caataaaacc aaacatgett ataacattaa gaaaaacaat aaagatacat gattgaaacc ....
                                                                       300
                                                                       301
      <210> 251
      <211> 301 ·
      <212> DNA
      <213> Homo sapien
      <400> 251
geogagytee tacattigge coagitteee origeatest elecagygee cetgeeteat
agacaacete atagageata ggagaactgg ttgccctggg ggcaggggga ctgtctggat
                                                                       120
ggcagggtc ctcasesatg ccactgtcac tgccaggses tgcttctgag cagtacacct
                                                                       180
cattgggatc aatgaaaagc ttcaagaaat cttcaggctc actctcttga aggcccggaa
                                                                       240
cototggagg ggggcagtgg aatocoagot coaggaogga tootgtogaa aagatateet
                                                                       300
                                                                       303
      <210> 252
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 252
geaaccaate actetyttte acytgaettt tateaccata caatttytyg catttectea
                                                                        60
ttttttacat igtagaatca agagtotasa tasatgtata tcgatgtott caagaatata
                                                                       120.
tcattccttt ttcactagga acccattcaa aatataagtc aagaatctta atatcaacsa
                                                                       180
atalateaag caaactggaa ggcagaataa ctaccataat ttagtataag tacccaaagt
                                                                       240
tttataeatc eaaagcccta atgataacca tttttaqeat tcaatcatca ctqtaqaatc
                                                                       300
                                                                       301
      c210> 253
      <211> 301
      <212> DNA
      <213> Homo eapien
      <400> 253
Eteoctaaga agatgitatt tigtigggit tigticocco tocatotoga tictogtaco
                                                                        60
CasCtataaa aaasaaataa agaaaaaatg tgctgcgttc tgsaasstsa ctccttagct
                                                                       120
```

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togtotoatt gitticagae ettaaaatat aaactigitt cacaagetti aatecaigig
                                                                        180
gattlittt ottagagaac cacaaaacat aaaaggagca agtoggactg aatacctgtt
                                                                        240
 treatagigo coacagggta titoticarat titoticata ggaaaatgei tittoccaag
                                                                        300
                                                                        301
       <210> 254
       <211> 301
       <212> DNA
      <213> Homo gapien
      <400> 254
cgctgcgcct ttcccttggg ggaggggcaa ggccagaggg ggtccaagtg cagcacgagg
                                                                         60
aacttgacca attoccttga agogggtggg ttaaaccctg taaatgggaa caaaatcccc
                                                                        120
ccaestetet teatettace ctggtggact cetgactgta gaattttttg gttgaaacaa
                                                                        180
gaaaaaaata aagctttgga cttttcaagg ttgcttaaca ggtactgaaa gactggcotc
                                                                        240
acttabactg ageoaggaaa agetgeagat ttattaatgg gtgtgttagt gtgeagtgee
                                                                        300
                                                                        301
      <210> 255
      <211> 302
      <212> DNA
      <213> Homo sapien
      <400> 255
agcettette tettettet tteettett tecatrasaa aatsgegeer tetateataa
                                                                        60
attactgawa tgtttotttt ctgaatataw atatwaatat gtgcaaagtt tgacttggat
                                                                       120
tgggattttg ttgagttett caagcatete etaataceet caagggeetg agtagggggg
                                                                       180
aggaaaaagg actggaggtg gaatctttat aaaaaaccaag agtgattgag gcagattgta
                                                                       240
abcettetta saatacabga ascaascaas asaatagags astaaaccac ccctaccac.
                                                                       30D
                                                                       302
      <21Q> 256
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (301)
      <223> n - A,T,C or G
      <400> 256
gttccagsaa acattgaagg tggcttccca aagtctaact agggataccc cctctagcct
                                                                        60
aggaccetee tecceacace tematerace maaccateem tmatgemeer agmtaggee
                                                                       120
acceccasea geotggaces ettgagcace cagttatgac caggacagec teatetetat
                                                                       180
aggozaatag otgotggoza actggoatta octggtttgt ggggatgggg gggozagtgt
                                                                       240
gtggcototo ggcotggtta gcaagaacat toagggtagg octaagttan togtgtbagt
                                                                       300
                                                                       301
      <210> 257
      <211> 301
      <212> DNA
      <213> Homo sagien
      <400> 257
gttgtggagg aactetgget tgeteattaa gteetaetga tttteactat ceeetgaatt
                                                                       60
toccocactta tittigicit toactatogo aggeottaga agaggiotac etgeolocag ...
                                                                       130
tettacetag tecagtetae eccetggagt tagaatggce atectgaagt gaaaagtaat
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gteacattae tecetteagt gatttettgt agaagtgeem atecetgaat gecaccaaga
                                                                        240
tettaatett cacatettta atettatete titgaeteet etttaceeg gagaaggete
                                                                        300
                                                                        301
      <210> 258
      <212> 301
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1) ... (301)
      \epsilon 223 n = A,T,C or G
      <400> 258 '
cagoagtagt agatgoogta tgoodgoacg cocagoacte coaggateag caccagoace
aggggggggg cagagggg cagaaggaag ataaacagta gggtgaagac cagagggacc
cccagggcaa caagaatcca ataccaggac tgggcaaaat cttcaaagat cttaacactg
                                                                        180
atgrotoggg cattgaggot gtosataana ogotgatoco otgotgtatg gtggtgtost
                                                                        240
tagtgatece taggaagegee agtagaagtaa eattagteea tagaaageag egeceacaac
                                                                        300
                                                                        ЗDŻ
      <210> 259
      <211× 301
       <212> DNA .
      <213> Homo Bapien
       <220>
       <221> misc_feature
       <222> [1]...(301)
       <223> n = A,T,C or G
       <400> 259
tcatatatgo asacasatgo agactangoo toaggoagag actataggae atotottggg
                                                                         БO
gtgtortgaa gtgatttgga cocctgaggg cagaceccta agtaggaatc ccagtgggaa
                                                                        120
gennagcent naggangece nggntteett gtgntenggn ngtgggeeng ganggtetgt
                                                                        180
tecageteae ateteatetg catgoagoac ggaceggatg egoceaetgg gtettggett
                                                                        Z40
                                                                        300
controcate tteteaagea gigiteetigi igageeatit geateetigg ciccaggigg
                                                                        301
       <210> 260
       c211> 301
       c212> DNA
       <213> Homo sapien
       <400> 260
ttttttttt coctarggaa aaagaaggaa caagtotoat aaaaccaaat aagcaatggt
                                                                         6₽
eaggtgtott aacttgasaa agattaggag toactggttt acaagttata attgaatgaa
                                                                        120
agaactgtaa cagccacagt tggccatttc atgccaatgg cagcaaacaa caggattaac
                                                                        180
tagggcaaaa taaataagtg tgtggaagee etgataagtg ettaataaac agaetgatte
                                                                        240
actgagacat cagtacctgo cogggoggoc gotogagoog aattotgoag atatocatoa
                                                                        300
                                                                        301
       <210> 261
       <211> 301
       <212> DNA
       <213> Homo sapien
```

```
<400> 251 '
 applattega geaaateetg taactaatgt gteteeataa aaggettiga acteagtgaa
 totgottoda tocacgatto tagonatgao ototoggada toasagotod tottaaggtt
                                                                         120
agcaccaact attroataca attoatcago aggamatama ggotottomg maggitomat
                                                                         180
ggtgacated aattictict gataatitag attecteaca accitectag tiaagigaag
                                                                        240
ggoatgatga teatecaaag eccagtggte acttacteca gaetttetge aatgaagate
                                                                        300
                                                                        301
       c210> 262
       <211> 301
       <212> DNA
      <213> Homo sapien
      <400> 262
gaggagagec tgttacagca titgtaagca cagaatacto caggagtatt tgtaattgtd
Egtgagette tigeegeaag teteteagaa attioaaaag aigeaaatee eigagieaee
                                                                        120
cctagacttc ctaaaccaga teetetgggg ctggaacctg gcactetgea tttgtaatga
                                                                        180
gggetttetg gtgcacacet aattitgtge atcittgeee taaateetgg attagtgeee
                                                                        24 D
catcattace eccacattat aatgggatag atteagagca gatactetee ageaaagaat
                                                                        300
                                                                        301
      <210> 263
      <211> 301
      <2125 DNA
      <213> Nomo Bapien
      <220>
      <221> misc_festure
      <222> (1) . . . (301)
      <223> n = A,T,C or G
      <400> 263.
tttagcttgt ggtaaatgac tcacaaaact gattttaaaa tcaagttaat gtgaattttg
                                                                         ΚĐ
aaaattacta ottaatoota attoacaata acaatggoat taaggtttga ottgagttgg
                                                                        120
ttottageat tatttatggt asataggoto ttacoacttg casatsactg gocacetest
                                                                        180
taatgactga cttcccagta aggeteteta aggggtaagt angaggatee acaggatttg
                                                                        24D
agatgotaag gooccagaga togtttgato caaceetett attttcagag gggaaaatgg
                                                                        300
                                                                        301
      <210> 264
     <211 × 301
      <212> DNA
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gggtgaaatt ggccaacttt ctattaactt atgttggcaa ttttgccacc aacagtaagc
                                                                       120
tggcccttct aatmamagam mmttgamagg tttctcmcta mmcggamatta mgtagtggmg
                                                                       180
                                                                       240
trangagaet recaggrete agogtaretg congagnage cantogaage canttetge
                                                                       300
agatateeat cacactggeg gnogetegan catgoateta gaaggneeaa ttegecetat
                                                                       301
      <210> 276
      <211> 301
      <212> DNA
      <213> Homo Bapien
      <400> 276
tgtacacate ctceateest eastgactgc attgtggtat tattactata ctgattatat
                                                                        60
ttatcatgtg acttctaett egasaatgte tccassagcs esscagcaga tataceasst
                                                                        120
                                                                        180
taaagagaca gasgatagac attaacagat aaggcaactt atacattgag aatccaaatc
                                                                        240
caatacattt aaacatttgg gaaatgaggg ggacaaatgg aagccagatc aaatttgtgt
                                                                        300
asaactatte agtatgttte cettgettes tgtetgagas ggeteteett castggggst
                                                                        361
       <210> 277
```

<211> 301 <212> DNA

<213> Homo sapien

```
c220>
                <221> misc_feature
                <222> (1)...(301)
                \langle 223 \rangle n = A,T,C or G
                <400> 277
  ttigttgatg tragtatttt attacttgrg ttatgagtgr tcacctggga aattrtaaag
                                                                                                                                                                      60
 atacagagga cttggaggaa gcagagcaac tgaatttaat ttaaaagaag gaasacattg
                                                                                                                                                                    120
  gaateatgge actectgata ettteccaaa teaacaetet caatgeceea ecctegteet
                                                                                                                                                                    180
  caccataging grandetea anispectating gathing cett anning the anispectation carried an expectation of the contract of the contraction of the contract of the con
                                                                                                                                                                    240
 gittenetate gattacatet gaccagiete etititeega agteenteeg ticaatetig
                                                                                                                                                                   300
                                                                                                                                                                    301
               <210> 27B
               <211× 301
               <212> DNA
               <213> Homo sapien
               <220>
               <221> misc_feature
               <222> (1)...(301)
               <223> n = A,T,C or G
               <40D> 278
 taccactaca etccageetg ggcaacagag caagacetgt etcaaageat aaaatggaat
                                                                                                                                                                     60
 ascatateaa atgasacogg gasaatgaag etgacoattt atggaageea gggettgtea
                                                                                                                                                                   1.20
 cagtetetae tgttattatg cattacrtgg gaatttatat sageerttas testastger
                                                                                                                                                                   190
 aatgaacato toatgtgtgo toacaatgtt otggcactat tataagtgot toacaggttt
                                                                                                                                                                   240
 tatgtgttet tegtaaettt atggantagg tacteggeeg egaacaeget aageegaatt
                                                                                                                                                                  300
                                                                                                                                                                  301
              <210> 279
              <211> 301
              <212> DNA
              <213> Homo sapien
              <220>
              <221> misc feature
              <222> (1)...(3D1)
              <223> n = A,T,C or C
              <400> 279
aaagcaggaa tgacaaagot tgettttetg gtatgtteta ggtgtattgt gaettttaet
                                                                                                                                                                    60
gttatattaa ttgccaatat aagtaaatat agattatata tgtatagtgt ttcacaaagc
                                                                                                                                                                 120
ttagacettt acetteeage caccecacag tgettgatat tteagagtea gteattegett
                                                                                                                                                                 180
atecatgigt aghtecasag cacataageh agaanaanaa atathtetag ggageactac
                                                                                                                                                                 240
catctgtttt cacatgaaat gccacacaca tagaactcca acatcaattt cattgcacag
                                                                                                                                                                 300
                                                                                                                                                                 302
             <210> 280
             <211> 301
             <212> DNA
             <213> Homo sapiem -
             <400> 280
ggtactggag tittcccccc ctgfgaaaac gtaactactg ttgggagtga attgaggatg
                                                                                                                                                                .. 60
tagazaggta gtagaaccaa allgiggica algazatag gagaztatga tictcactci
```

```
tgagaxaaaa acccaagatt agoocaggta gttgootgta acttcagttt ttotgootgg
                                                                       180
gtttgatata gtttagggtt ggggttagat taagatotaa attacarcag gacaaagaga
                                                                       240
cagactatts actocacagt tastiasgga ggtatgttcc atgtttattt gttasagcag
                                                                       300
                                                                       301
      <210> 281
      <211> 301
      <212> DNA
      <213> Romo sapien
      <400> 281
aggtacaaga aggggaatgg gaaagagctg ctgctgtggc attgttcaac ttggatatte
                                                                       . 60
gccgagcaat ccaaatcctg aatgaagggg catchtchga aaaaggagat ctgaahctca
                                                                       120
atgtggtage aatggettta tegggttata eggatgagaa gaacteeett tggagagaaa
                                                                       1BG
tgtgtagcac actgcgatta cagctasata acccgtattt gtgtgtcatg tttgcatttc.
                                                                       240
tgacaagtga aacaggatet tacgatggag tittgbatga aaacaaagti geagtacete ...
                                                                       300
                                                                       301.
g .
      <210> 282
      <211> 301
      <212> DNA
      <213> Homo_sapien __
      c400> 282
caggiactac agazttaaaa tactgacaag caagtagtti citiggegige acgaatigea
                                                                        60
tecagaaccc assauttaag sautteaasa agacattttg tgggcacctg ctageacaga
                                                                       120
agogeagaag caaageeeag geagaaceat getaacetta cageteagee tgeacagaag
                                                                        180
cgcagaagca aagcccaggc agaaccatgc taaccttaca gctcagcctg cacagaagcg
                                                                        240
cagaagcaaa gecenggeag aacatgetaa eettacaget cageetgeac agaagcacag
                                                                       300
                                                                        301
      <210> 283
      <211> 301
      <212> DNA
      <213> Romo sapien
      <400> 283
atotytatao ggcagacasa ottitatarag tytagagagg tyagogaaag gatycaaaag
                                                                        бĎ
cactttgagg getttataat aatatgetge ttgamamaaa aaatgtgtag ttgataetea
                                                                        120
qtgcatctcc agacatagta aggggttgct ctgaccaatc aggtgatcat tttttctatc
                                                                        190
actteccagg tittatgeaa aaattitigti aaattetata atggtgatat geatetitta
                                                                        240
ggaaacatat acattittaa aaatctatti tahgtaagaa cigacagacg aattigcitt
                                                                        300
                                                                        301
      <210> 284
      <211> 301
      <212> DNA
      <213> Homo gapien
      <40D> 284
caggiacasa acgctattaa giggottaga attigascat tigiggiott talitaciti
                                                                        ΕĐ
gettegtgtg tgggeaaage aacatettee etaaatatat attaceaaga aaageaagaa
                                                                        120
gragattagg tittigaraa baraaaragg craaaagggg grigarrigg agragagrat
                                                                        180
ggtgagagge aaggcatgag agggcaagtt tgttgtggac agatetgtge etactttatt
                                                                        240
                                                                        300
actggagtas asgasaacaa agttcattga tgtcgaagga tatatacagt gttagsaatt
                                                                        301
```

```
<211> 301
       <212> DNA
       <213> Komo eapien
       <220>
       <221> misc_feature
       <222> (1)...(301)
       \langle 223 \rangle n = A,T,C or G
      <400> 285
acatcaccat gatoggatoc cocacccatt atacgttgta tgtttacata satactette
astgatcatt agtgttttas assassisct gassactect tetgeateer satetetase
                                                                        120
caggaaagca aatgctattt acagacetge aageettee teaaacnaaa etatttetgg
                                                                        180
attazatatg tetgaettet titgaggica caegactagg caaatgetat tiaegatetg
                                                                        240
casaagetgt ttgaagagte aaageeecca tgtgaacaeg atttetggae eetgtaacag
                                                                        300
                                                                        301
       <210> 286
      <211> 301
      c212> DNA
      <213> Homo sapien
      <400> 286
taccactgca ttccagcctg ggtgacagag tgagactccg tctccaaaaa aaactttgct
                                                                         60
tytatattat tittycctta cagtygatca étotagtagy aaaggacagt aagatttitt
                                                                        120
atcaaaatgt gtcatgccag taagagatgt tatattcttt tetestttet teeceaceca
                                                                        180
assalsaget accalstage tistasgiet essattitig cetitiacta assigigati
                                                                        240
gtttetgtte attgtgtatg etteateace tatattagge aaatteeatt tttteeettg
                                                                        300
                                                                        301
      <210> 287
      <211> 301
      <212> DNA
      <213> Homo gapien
      <400> 287
tacagatetg ggaactaaat attaaaaatg agtgtggetg gatatatgga gaatgttggg
                                                                         60
cccagaagga acgtagagat cagatattac aacagctttg ttttgagggt tagaaatatg
                                                                        120
asatgatttg gttatgaacg cacagtttag gcagcagggc cagaatcctg accetctgcc
                                                                        180
cogtogttat ctcctcccca gcttggctgc ctcatgttat cacagtatte cattttgttt
                                                                        340
gttgcatgte ttgtgaagec atcaagattt tetegtetgt ttteetetea ttggtaatge
                                                                        300
                                                                        301
      <210> 288
      c211> 301
      <212> DNA .
      <213> Homo sapien
      <400> 288
gtacacctaa ctgcaaggac agctgaggaa tgtaatgggc agccgctttt aaagaagtag
                                                                        60
agtokotagg segeraeett oragitoreg ricegtorgg gtatorgree egorgoeese
                                                                        120
gatotttaaa gacaatttca agagaatett Eccttaaagt tggcaatttg gagatcatac
                                                                        180
assageatet getittgigs tittastitag etestetgge caetggasgs siccasacag
                                                                        24 D
tetgeettaa titiggatga atgeatgatg gaaatteaat aatttagaaa gitaaaaaaa
                                                                        30D
                                                                        301
```

<210> 289 <211> 301

```
<212> DNA
       <213> Homo sapien
       <220×
       <221> misc_feature
       <222> (1)...(301)
       \langle 223 \rangle n = A,T,C or G
       <400> 289
 ggtacactgt ttccatgtta tgtttctaca cattgctace tcagtgctcc tggaaactta
 gettttgatg tetecaagta gtecacette atttaactet ttgaaactgt atcatetttg
                                                                         120
 ccaagtaaga gtggtggcct atttcagctg ctttgacaaa atgactggct cctgacttaa
                                                                         180
 cgttctataa atgaatgtgc tgaagcaaag tgcccatggt ggcggcgaan aagagaaaga
                                                                         240
tytyttttyt titygaciet etytyyteee ticeaatyet ytyyyttee aaccaynyga
                                                                         300
                                                                         301
       <210> 290
       c211> 301
       <212> DNA
       <213> Homo sapien
       c2205
       <221> misc_feature
       <2225 (1)...(301)
       \langle 223 \rangle n = A,T,C or G
       <400> 290.
 acactgaget ettettgata aatatacaga atgettggea tatacaagat tetatactae
                                                                         60
 tgactgatet gtteatttet eteacagete ttacccccaa aagettttee accctaagtg
                                                                         120
 threqueric officers caregraggy atagaggrag ancrectar astgascatg
                                                                         180
 gagttotato aagaggoaga aacagcacag aatoocagtt ttaccattog ctagcagtgo
                                                                         24D
                                                                         300
 tgccttgaac aaaaacattt ctccatgtct cattttcttc atgcctcaag taacagtgag
                                                                         301
       <210> 291
       <211> 301
       <212> DNA
       <223> Homo sapien
       <400> 291
caggiaccae titritciai cciagaaaca titratitta igligilgaa acataacaac
                                                                         GO
 tatateaget agattittit totatgetti acctgetatg gaaaattiga cacatteige
                                                                         120
 tttactcttt tgtttatagg tgaatcacaa aatgtatttt tatgtattct gtagttcaat
                                                                         180
 agecatgget gtttacttea titaatttat ttageataxa gacattatga aaaggeetaa
                                                                         240
 acatgagett cartteeres ctaartaatt ageatetett attictiaac egtaatgeet
                                                                        300
                                                                        3 D 1
       <210> 293
       <211> 301
       <212> DNA
       <213> Homo sapien
       <22D>
       <221> misc_feature
       <222> (1) ... (301)
       <223> n = A, T, C or G
       <400> 292
```

A CONTRACTOR OF THE PARTY OF TH

```
accttttagt agtaatgict aataataaat aagazatcaa tittataagg toratatage ...
                                                                      6 D
tgtattaaat aattittaag titaaaagat aaaataccat cattitaaat qitggtatic
                                                                     120
aaaaccaaag natataaccg aaaggaaaaa cagatgagac ataaaatgat ttgcnagatg
                                                                     190
ggaaatatag tasttyatga atgttnatta aatteeagtt ataatagtgg etacacacte
                                                                     240
tractaraca cacagacore acagicotat algocacasa cacatitoca taaciigaaa
                                                                     300
                                                                     301
      <21D> 293
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 293
ggtaccaagt gotggtgeca gootgttace tgttotcact gaaaagtotg gotaateete
                                                                      60
ttgtgtagte acttctgatt ctgacaatca atcaatcaat ggcctagage actgactgtt
                                                                     120
aacacaaacg teactageaa agtageaaca getttaagte taaatacaaa getgttetgt
                                                                     180
9tgagaattt tttaaaaaggc tacttgtata ataaccettg teatttttaa tgtacetegg
                                                                     240
cogogacean getaegooga attotgraga tatonatoan antggoggon getogagoat
                                                                     300
                                                                     301
      <210> 294
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 294
tgacccataa caatatacac tagotatott tttaactgto catcattago accaatgaag.
                                                                      60
attematasa attacettta teracacate teasascast tetgesastt ettagtgaag
                                                                     120
titaactata gicacaganc tiaaatatic acatigitii etaigietae igaaaataag
                                                                     180
tteactacte ttetgggata ttetttacaa aatettatta aaatteetgg tattateace
                                                                     240
cccanttata captagoaca accaecttat gtagttttta catgataget etgtagaggt
                                                                     300
                                                                     301
      <210> 295
      <211> 305
      <212> DNA
      <213> Homo sapien
      <400> 295
gtactctttc tetecectee tetgaattta attettteaa ettgeaattt geaaggatta
                                                                      60
120
tiggitigig aatocatott gottittood cattggaact agicatiaac coatoteiga
                                                                     180
actsstagaa aaacrtotga agagotagto tatoagoato tgacaggtga attggatggt
                                                                     240
totoagaaco atttoacoca gacagootgt ttotatoctg tttaataaat tagtttgggt
                                                                     300
tetet
                                                                     305
      <210> 296
      <211> 301
      <212> DNA
      <213> Homo sapion
 --- <40Q> 29$
aggtactatg ggaagetget aaaataatat ttgatagtaa aagtatgtaa tgtgetatet
                                                                     6 D
```

<212> DNA

<213> Homo sapien

```
cacctantas tasactaaaa ataaactgaa actitatgga atcigaagit attiticitig
                                                                       120
attaaataga attaataaac caatatgagg aaacatgaaa ccatgcaatc tactatcaac
                                                                       180
titgaaaaag tgatigaacg aaccacttag Ctiticagatg atgaacactg ataagtcatt
                                                                       240
tgicattact atamattita amatcigita atamgatggc ciatogggeg gammangggg
                                                                       300
                                                                       301
      <210> 297
      <211> 300
      <212 DNA
      <213> Nomo sapien
      <220>
      <221> misc_feature
      <2225 [1]...(300]
      <223> n = A,T,C.or G
      c400> 297
actgagtttt mmctggmcgc cmmgcmggcm mggctggmmg gttttgctct ctttgtgctm
aaggttttga aaarcttgaa ggagaatcat tttgacaaga agtacttaag agtrtagaga
                                                                       120
acaaagangt gaaccagotg aaagctotog ggggaanott acatgtgttg ttaggcotgt
                                                                       180
tecateatty ggagtgeact percatecet casaatttet etgegetgee etgagtgete
                                                                       240
acogcacete ggeegegaee aegetaagee gaattetgea gatateeate acaetggegg
                                                                       300
      <210> 298
      <211> 301
      <212> DNA
      <213> Homo aapien
      <220>
      <221> misc_feature
      <222> (1) ... [301]
      c223> n - A,T,C or G
      <400> 298
tatggggttt steacceaaa agetgatget gagaaaggee teectgggge coefceoges
ggcatctgag agacctggtg ttccagtgtt tctggaaatg ggtcccagtg ccgccggctg
                                                                       120
tgaagetete agateaatea egggaaggge etggeggtgg tggccacetg gaseeseet
                                                                       180
gtectgtetg titacattic actaycaggt titetetggg cattacnatt tgttececta
                                                                       240
caacagtgac ctgtgcattc tgctgtggcc tgctgtgtct gcaggtggct ctcagcgagg
                                                                       300
                                                                       301
      <210> 299
      <211> 301
      c212> DNA
      <213> Homo sapien
      <400> 299
gittigagac ggagitticae teligitigee cagactegae igeaatggea gggiteteige
                                                                        .6Ω
tractgrace etetgected caggitogag caattetest geetcageet eccaggiage
                                                                       130
tgggattgca ggctcacgcc accataccca gctaattttt ttgtattttt agtagagacg
                                                                       180
gagtttegec atgttggcca getggtetea aacteetgae etcaagegae etgeetgeet
                                                                       240
                                                                       300
eggeeteeca aagtgetgga attataggea tgagteaaca egeecageet aaagatattt
                                                                       101
      <210> 300
      <211> 301
```

```
attoagtiti attigeigeo coagtatoig taacoaggag igocacaaaa ictigeraga
                                                                         60
 tatgtoccae acceeetggg aaaggeteen acctggetae tteetetate agetgggtea
                                                                        120
 gotgeattee acaaggitei cageotaatg agitteacta cofgecagie teaaaactia
                                                                        180
 glassgrasg accatgarat torrerangg asstragagt tigrorrace giotigicae
                                                                        240
tatasagect gentetaada gtenttgett etteaesena atoregageg eatoreceat
                                                                        300
                                                                        301
       <210> 301'
       c211> 301
       <212> DNA
       <213> Homo gapien
       <400> 301
ttaaattitt gagaggataa aaaggacaaa taatctagaa atgigtette ticagtetge
                                                                         60
agaggacecc aggictocaa gcaaccacat ggicaagggc atgaataatt aamagtiggi
                                                                        12D
gggaacteac aaagaecete agagetgaga cacecacaac agtgggaget cacaaagace
                                                                        180
ctcagagets agacacceae ascagtggga geteacaaag acceteagag etgagacace
                                                                        240
cacaacagra cetegiteag etgecacatg tgtgaataag gatgeaatgt ecagaagtgt
                                                                        300
                                                                        301
      <210> 302
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 302
aggiacacat thagetigig ghawabgach dacawaacig attitaaaat cawgitaatg
                                                                         60
tgaattttga aaattactac ttaatcctaa ttcacaataa caatggcatt aaggtttgac
                                                                        120
tigagitggi icitagiati attiatggia aataggetet taccactige aaataactgg
                                                                        180
ccacatratt aatgactgac ttcccagtaa ggetetetaa ggggtaagta ggaggateca
                                                                        24 D
caggatitga gatgotaagg occoagagat ogtitgatoc aaccototta tittcagagg
                                                                        300
                                                                        301
      <210> 303
      <211> 301
      c212> DNA
      <213> Homo sapien
      c400> 303
aggtaccaac tgtggaasta ggtagaggat catititict ttccatatca acteagtict
                                                                        60
ataligitti tigacagitt aacacateti ettetgicag agattettie acaatagrae
                                                                       120
tygctaatgy aactacogot tycatgitaa aaatgytyyt tigigaaatg atcataggod
                                                                       180
agtaacgggt atgittitet aactgatett tigetegtte caaagggace teaagactte
                                                                       240
categattit atatetgggg tetagasaag gagttaatet gtitteeete ataaatteae
                                                                       300
                                                                       301
      <210> 304
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 304
acatggatgt tattitgeag actgicaacc tgaattigta titgcitgac attgcctaat
                                                                        60
tattagtite agitteaget tacceactit tigtetgeaa catgearaas agacagtgee
                                                                       120
ctitttagtg tetcetatca ggaatcetct cacattggtt tgtgccatta ctggtgcagt
                                                                       180
gartttrage cartigggta aggiggagti ggesatolgt streasigs aaattasiga
                                                                       240
```

```
ttttcctttt gtaattaata agtgtgtgtg tgaagattct ttgagatgag gtatatatct
                                                                         300
                                                                         301
       <210> 305
       <211> 301
       c212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(301)
       <223> n = A,T,C or G
       <400> 305
gangtacago giggicaagg taacaagaag aaaaaaatgi gagiggcato cigggatgag
cagggggaca gacctggaca gacacgttgt catttgctgc tgtgggtagg aasatgggcg
                                                                        120
taaaggagga gasacagsta caasatotoo aactosgtat taaggtatto toatgootag
                                                                        180
aatattegta gaaacaagaa tacattcata tggcaaataa ctaaccatgg tggaacaaaa
                                                                        240
ttotoggatt taagitogai accaangaaa tigtattaaa agagotgito atggaataag
                                                                        300
                                                                        301
      ~<210>~-306~
       <211> 8
       <212> PRT
      <213> Homo sapien
      <400> 306
Val Leu Gly Trp Val Ala Glu Leu
      <210> 307
      <211> 637
      <212> DNA
      c213> Homo sapien
      <400> 307
acagggraty asgggssagg gagsggatga ggsagccccc ctggggsattt ggtttggtcc
rtgtgatcag gtggtetatg gggettatee etacaaagaa gzateeagaa ataggggeae
                                                                       120
attgaggaat gatacttgag cocasagago attoaatcat tgilttattt goottmillt
                                                                       180
cacaccatty gigagggagg gattaccacc ciggggital gaagaiggti gaacaccca
                                                                       240
cacatageae eggagatatg agatemmeng tetettagee atagagatte acagecoaga
                                                                       300
geaggaggae gettgeacae catgeaggat gaeatggggg atgegetegg gattggtgtg
                                                                       360
aagaagcaag gactgttaga ggcaggcttt atagtaacaa gacggtgggg caaactctga
                                                                       420
tttccgtggg ggaatgtcat ggtcttgctt tactaagttt tgagactggc aggtagtgaa
                                                                       480
actuattags ofgagazeet figtiggaafge actigaceea actigatagag gaagtageea
                                                                       -540
ggkgggagee tttercagtg ggkgtgggae atatetggea agattttgtg geactectgg
                                                                       600
ttacagatac tggggcagca astasaactg satcttg
                                                                       637
      <210> 308
      <211> 647
      <212> DNA
      c213> Homo sapien
      <220>
     <221> misc feature
      <222> (1)...(647)
    <223> n = A, T, C or G
```

TANK THE PERSONS AS

等1.10.00mg/45.60mg

```
<400> 3DB
 acquittica traccargra autogggton orcanggggo canceacago tgggagobac
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 ggngcctcac agtatagate tggtageasa gaagaagaaa caaacactga tetetttetg.
                                                                        180
 ccacccctct gaccctttgg sactcctctg accctttaga acasgcctac ctsatstctg.
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 ctagagaaaa gaccaacaac ggcctcaaag gatctcttac catgaaggtc tcagctaatt
                                                                        300
 cttggctaag atgtgggttc cacattaggt totgaatatg gggggaaggg tcaatttgct
                                                                        350
 cattligigt giggataaag toaggatgoo caggggooag agcagggggo tgottgotti
                                                                        420
 gggsaceatg grigagesta taarcalagg tiatggggaa raaaacaaca traaagicar
                                                                        480
 tgtatchatt gccatgaaga cttgagggac ctgaatctac cgattcatct taaggcagca
                                                                        540
 ggaccagitt gagiggcaac aaigcagcag cagaalcaai ggaaacaaca gaaigaiigc
                                                                        6 D D
 aatgteettt ttitteteet gettetgaet tgataaaagg ggaeegt
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                                                                        120
 gagracatet teageaagag ggggaaatae teateatett tggeeageag ttgtttgate
                                                                        180
 accanacate atgecagaat acteageaaa cettettage tettgagaag teaaagteeg
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taggaaagag aaacacagaa ggaagagaca caataaaagt cattatgtat tetgtgagaa
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atgattatgt cattacatgt atggtagtga tggggatgat aggaaggaag aacttatggc
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  aasstggggs sactotgesg ggttttaagt atcttacotg asgctacaga otccatasco
                                                                           300
  tetetttaca gggageteet geageceeta cagaaatgag tggetgagat tettgattge
                                                                           360
  acagcaagag cttctcatct asaccctttc cotttttagt atctgtgtat caagtataaa
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                                                                           526
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  teatitetga aageagtiga geractitat teessagtae actgesgatg ticasactet
                                                                           60
  coatttetet ttecetteea cetgecagtt_ttgctgacte_teaacttgte_atgagtgtaa
                                                                          120
 geattaagga cattatgett ettegattet gaagacagge eetgeteatg gatgaetetg
                                                                          180
 gettettagg aasatatttt tetteeassa teagtaggas atetasaett ateceetett
                                                                          240
 Egragatgic tagragette agarattigg thakgaacce atgggaaaaa aaaaaateet
                                                                         300
 tgctaatgtg gtttcctttg taaaccanga ttcttatttg netggtatag aatatcaget
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 tagtettast tatetattgg
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                                                                         60
ctortgeest gosgeteett aecatcarta gazacagcaa gatgecesta teatgtotas
                                                                        120
gragigacat grittigese attrecagee erittaasta teeaescaea caggaageac
                                                                        GBL
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geotogocot gtgcctgntc cogottgtga gggaaggaca ttagaaaatg aattgatgtg
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ttoottaaag gatggcagga amacagatoo tgttgtggat atttatttga acgggattac
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agatttgaee tgeagtrers amptgageat taccaatgag aggasaacag acgagamaat
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cttgatggtt cacaagacat gcaacaaaca aaatggaata ctgtgatgac acgagcagcc
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aactggggag gagataccac ggggcagagg tcaggattet ggccctgctg cctaactgtg
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ogitatacca atcatttcta titctaccct caaacaagct gingaatatc igacttacgg
                                                                        600
ttettntgge coacatétte atnatecace contentitt amnittante camantgt
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                                                                        718
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coacatgtgt agatetettg tettattett ttgtetataa taetgtattg tgtagte	caa 180
geteteggta geocagecae totgaaacat geteeettta gattaacete geggaeg	ctc 240
tigtigtatt getgaactgt agigccetgt attitgctic igictgigas itcigit	get 300
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	•
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Sagoggotgo cottettet tettettet ggggggaatt tettett aatagetatt	6 D
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	150
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Laysylgur Ligiaeccag Claiggrata qqiqilaecc assuccidad tasanatoon	120
tgcctctgag-aaatcaaagt-cttcatacac t	151
.018. 700	
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17745 Traus BUNTOIL	•
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triggering greatining cacaggorit descaptor acceptions	120
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-010 100	
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'<213> Homo papien	
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reductions tactaccoag coordinate twoquadaa atchaacean accessors	120
recamely a seasacactt ancocatges a	151
	~~~
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PDD	
<22D>	

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                                                                         The state of the same of the s
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 accigiging antitoaget ticoteatge anaaggatti intarceecy gectacting
                                                                                                                                ۵D
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                                                                                                                              120
 agagitacia ogaatoocat citggitoca gotatatoac tgacagoatg giagaagaci
                                                                                                                              180
 segaacetca ettetagaet tteaeggtgg gaegaaaegg gtteagaaac tgecagggge
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                                                                                                                              24 D
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                                                                                                                             30D
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           c2105 326
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taaogacctc atgeteatea agttggacga atcogtgtee gagtetgaca ccatcoggag
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cateageatt gettegeagt gecetacege ggggaactet tgeetegttt etggetgggg
                                                                                                                             36 D
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tgaggaggte tgeagtaage tetatgacee getgtaceae eccageatgt tetgegeegg
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1215
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> <210> 329 <211> 77 c212>. PRT <213> Homo sapien

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getgeageca
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Val Ser Gly Ser Cys Ser
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                                                                        24 D
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takktytyte tteceteges esteseetyy gasyystees etteestase etgesyygey
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teteettitt cateaagaet eeteageagg gageeeagae cageetgeae tgtgeettaa
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ascoccacct ctactaasaa tigigistatat ciligigigi citocigiti aigigigoca
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aactacccac caagagcaca tgggtagcag ggaagaagta aaaaaagaga aggagaatac
                                                                      1740
```

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	assaasaaa	aaaaatccta	acgaggeeet	335858355	agtgtggcaa	actcagasas agagasassas	1920
	we care creat	ggactgatat	tootaattat	ggteaatitta	araaratht.		1980 2040
	rrrarattat	Crcdacaada	てじぬままるしつしつ	totoccasas	++++444	L-44	2100
,	ttgtttggag	totoctatto	tanegattt	agtotaagga	attagtagtg gaatgacaat	ttcccatesc	2160
		yyaaagagtt	ataqqaccac	agtetteact	tetmataert	atanathash	2220
	errecerrede	actogititg	accattaage	tatatottta	Paga tootics	thttppppp	2280 2340
	uuuc tagaaa	PACCCCGAta	atagtgcaga	ataaatoaat	teatorttea	AFFALLELL	2400
	аатваавасд	taagaattaa	Ragitiont	acasassass	ttettgtett	cetttaccag	2460
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<213> Homo sapien

<40D> 333

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4		7	v_cctagattc	C::CCTCCCCCC	Bearchrates	Distriction and the second	120
	~	_ 44443444	r ratification	t teostobio	こ ごおおのかみじゅも。	A ~~~~++~~	180
	-223-26477	a maaaaadacdi	A wercidate	T CCCACTCCC	e tetamenan	WHEN SYNESS! I	240
	-33-	- JULOSOULHU	L 416886686	I CCCCCTTGG	i trtmossom		300
		* WAR CONTOCK	i cuccetagai	I COCCCCACO	7 manntnase.	·	360
			- Adatrocres	- CCLGCCG861	: Obccccoaw	WARRANA M	420
		- 320436686	- ecgueraci	. accomena	a dactecese	3 000000000	480
	-34400000	Legerere	- gagtt tqcc i	. CCtatecero	: atateerod:		540
	++-+3300M	, etactrigat	, acarcraca:	i tocaoactei	: Adattartari		600
	J 3		. gryyacayti	. ACCAGICETO	1 のほうしょうかんり	* OMPANATEMA	660
		. 3 -9 - Lybuar	1 44444446	Lacceaceate	* ************	* **=====	720
	3 - m 3 - c - c		, caccccccta	i acqeetoeoc	: ct.ttcatem	DDDDDDDD	780
		_ 3 ^ 4 ^ 6 ~ 6 P P P P P P P P P P P P P P P P P		: OUGAGCERNA	. <i> </i>		840
	-3	caradarrana	i Eggrycaaqa	LCCCCCCACC	. Caccageet e	tramovamaa	900
	0			CCARACTA	(インングルナトッチャ		960
		Caroline Contraction	ANDMCCCCCC	tacctaaaha	COSCOSCOS	335tonn-L	1020
	- · · · · · · · · · · · · · · · · · · ·	3	- Fractagoes	LAGGGGGGGAAA	· ^^^	t farbasas.	1080
		CONCACEFFF	LCCAGGCCAG	LUGCEGCEGG	` <i>ACTATTCMEN</i>	DAMBARANA	1140
	-000	30007570	_A Redacordaga	CCCCRTGtga	Cabeccacta	D70070	1200
	******	craarccaat	たかよかってにってき	catectosos	referens who w	b	1260
		-3-cargare	4 LLBUCCLCA	LATETTOTAL	グドログムハクトッナ	#Pagana	1320
	-33			. Latuaacaaa	tttaaaaaa	Catenaette.	1380
	033300	nanne reads	CCCCCCCCCCC	ttacacetet	Cacceteges	2020220622	1440
	3	<u> </u>	gcagacccgt	tatatoacto	tostatecore	+	1500
		coacranacs	ggrggacear	. Takaaaaact	abetettaar	CEMPANTENE	1560
		Addractor	ACTUATORIE	######################################	teatteatea	MARKE PARKS	1620
			caecaddcid	CCCCtactca	Stockhooke		1680
		2ndraded Care	444 (48 (66	CCATFAAFff	CCECCCCC	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1740
	D D O	ween receigi	UHHILLUGGAC	Calagraget	でントクロトナナット	+	1800
•	~~··~	3443 603 0 63	CCLUCATECE	EGC2E3Ctt>	COPPE PROPER		1860
-	A A.A.A.	コペコス ヘス ヘベヤセ	CCCCACCCCC	CCADECCADO	7 3 m - A - A - A - L		1920
		コーニスストオケアの	AGEA HACE GE	EEGCAGAAAA	かがれるのとれをれる	All the Annual Profile	1980
			CACLCLCLOH	LUCKANAPAN	ベキベベベストのスタ	* ~ ~ ~ ~ ~ ~ · · · · · · · · · · ·	2040
•		~ - 33		QCCCCCCT + rat	actant park		3100
		~ シコココココレン い	SCOMMONIC	CCCCCACDAT		GROOKES	2160
	40	~3 ~~ > au < c < 7.7	ベクスクラククロクス	Carcoart.ca	atouroaata	Otomostome :::	2220
•	-aa-Araarad	craataasa	Beededaced	ccactacctc	gaggacattt	ccctcccgga	2280

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活 医电影 经营业人

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2984

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Pro Lys Gln Pro Gln Lys Arg Ser Arg Ala Ala Phe Ser His Thr Gln
Val Ile Glu Leu Glu Arg Lys Phe Ser Hiz Gin Lys Tyr Leu Ser Als
Pro Glu Arg Ala His Leu Ala Lys Asn Leu Lys Leu Thr Glu Thr Gln
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Val Lys Ile Trp Phe Gln Asn Arg Arg Tyr Lys Thr Lys Arg Lys Gln
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                                     90
                                                          95
Leu Ser Ser Glu Leu Gly Asp Leu Glu Lys His Ser Ber Leu Pro Ala
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Leu Lys Glu Glu Ala Phe Ser Arg Ala Ser Leu Val Ser Val Tyr Asn
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15 Committee 10 Committee 15

BNSDOCID: <WO___0134802A2TI_>

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Gly Ala Arg Val Tyr Leu Ala Cys Arg Asp Val Glu Lys Gly Glu Leu
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Arg Lys Leu Asp Leu Ber Asp Thr Lys Ser Ile Arg Ala Phe Ala Lys
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Gly Phe Leu Ala Glu Glu Lys His Leu His Val Leu Ile Asn Asn Ala
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His Ile Gly Val Asn His Leu Gly His Phe Leu Leu Thr His Leu Leu
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Leu Glu Lys Leu Lys Glu Ser Ala Pro Ser Arg Ile Val Asn Val Ser
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Ser Leu Ala His His Leu Gly Arg Ile His Phe His Asn Leu Gln Gly
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Olu Lys Phe Tyr Asn Ala Cly Leu Ala Tyr Cys His Ser Lys Leu Ala
Asn lle Leu Phe Thr Gln Glo Leo Ala Arg Arg Leo Lya Gly Ser Gly
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Val The The Tyr Ser Val His Pro Gly The Val Gln Ser Glu Lou Val
                                        235
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Arg His Ser Ser Phe Met Arg Trp Met Trp Trp Leu Phe Ser Phe Phe
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Ile Lys Thr Pro Glo Glo Gly Ala Glo Thr Ser Leu His Cys Ala Leu
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<213> Homa sapien

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 cagaagggtc tgaactetac gtgttaccag agaacataat gcaattcatg cattccactt
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                                                                        251
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 cggctggaat tgctctggtt atgatgacag agaaaatgat ctcttcctct gtgacaccaa
                                                                        180
caccigiama tiigaigggg maigiliaag aatiggagac acigigacii gcgicigica
                                                                        24D
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tgagtgttac ctgcgacagg ctgcatgcaa acagcagagt gagatacttg tggtgtcaga
                                                                        360
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                                                                        48D
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                                                                        540
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ceacatacet tyteoggaze attacaatgg ettetgeatg catgggaagt gtgagcatte
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tateaataig caggagccat ctligeaggig igaigciggt talaciggac aacacigtga
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tabgatassa acaaccatty tattectytt tttetasses gteetasttt etascaetyt
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atalateett Cgacatcoat gaactitgit tictittact ecagtaataa agtaggcaca
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gatetgieda caacaaacti gedeteteat geditgeete iraccatgei etgeledagg
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tragereret titiggreigt tigittigte aaaaacetam tetgettett gettitetig
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caggetgegt tergteetta egatgaagae caegatgeag titecaaaca tigecactae
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atacatggaa aggaggggga agccaaccca gaaatgggct ttctctaatc ctgggatacc
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aataaqcaca a
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                                                                       180
gateaggcaa cttatacatt gacaatccaa atccaataca tttaaacatt tgggaaatga
                                                                       24D
                                                                       300
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                                                                       160
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                                                                       48D
                                                                       S4D
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                                                                       180
atocacaagt catacotyga tytoagogaa gagggcacyg aggcagcagc agccactggg
                                                                       240
gacageateg etgtasaang cetaecaatg agageteagt teaaggegaa ecaeecette
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etyttettta taaggeacae teataccaac acgateetat tetytyyeaa gettyeetet
                                                                       360
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gtgactttcc cacggecama magetgttcm caceteacge acetetgtgc etcagtttgc
                                                                       42 D
                                                                       48D
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<210> 356

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 gtotottagg gaggottaaa totgtotoag gtgtgotaag agtgooagoo caaggkggto
                                                                        24 D
 annaticene annacticas tettigeigs gatastaage caaseagige eiggacagea
                                                                        300
 gagtictitt citgggcaac agataaccag acaggactct aatcgtgctc ttattcaaca
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 ticticigic telgectaga etggaalaaa aagecaalot etelegigge acagggaagg
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 agatacaago togittacat gigatagato taacaaaggo alotacogaa giciggicig
                                                                        48D
 gatagacggc acagggaget ettaggtcag egetgetggt tggaggacat teetgagtee
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araarataag tgttatatgg eesgesgggc ettcasgcac actasersse cctgaggkas
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gcatagagta gggaagctaa tecageacag ggaggteaca gagacatece taaggaagtg
                                                                       180
$89tttaaac tgagagaagc aagtgottaa actgaaggat gtgttgaaga agaagggaga
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gaaagagagc tagaacagct ggagccgttc tcoggtgtaa agaggagtca aagagataag
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attaaagatg tgaagattaa gatottggtg goattoaggg attggcactt ctacaagaaa
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      c2115 620
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ctcaccages gestessgig cictgcregi teltasaggs tiactgcigg igantimasi
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tgcaacatta tgcttcatga ataatatgta gaaagaaggt ctgatgaaaa tgacatcctt
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tactcatcat titiggocag cagitititg atcaccaaac atcatgocag aatactcago
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agattettag t
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                                                                       420
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tgagasagct caattataga tgcaaagtta taactaaact actatagtag taaagaaata
                                                                        24 D ·
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acgtgcatag taaatettta tatttgetat ggegttgcac tagaggactt ggactgcaac
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<213> Homo sapien

<400> 367

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<210> 368

<211> 1512

<212> DNA

<213> Homo sapien

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का के प्राप्त के सम्बद्धा परिचाल के के कि प्राप्त का सम्बद्धा कर कर है।

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<210> 369 . <211> 1853 <212> DNA

<213> Homo sapien

<400> 369

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<210> 370

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नित्ति । इति विश्वविद्यास्ति । स्टब्स् वित्ति । विभिन्ने साम्बद्धाने स्टब्स्ट्रेस

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                                                                         360
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 congaraacy assignass gratiaces attrices tagtricine craceasses
                                                                       1440
 asacagatgo caasatacto ttotgaaaao agoaaccoag aacaagactt saagetgaca
                                                                       15 DO
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                                                                       1920
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 Leu Asp Gly Gln Gly lu Arg Gln Glu Gln Arg Gly His Phe Trp Arg
     50
                         55
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Pro Gln Arg Leu Leu Cys Glu Asp Ala Trp Glu Gln Glu Val Gln Val 70 Val Leu Pro Leu Leu Pro Leu Leu Gln Gly Ser Gly Lys Ser Asn Val 85 Val Ala Trp Gly Asp Tyr Asp Asp Ser Ala Phe Mot Asp Pro Arg Tyr 105 100 His Val His Gly Glu Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp 12 D Gly Lye Val Pro Arg Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp 135 Val Asn Lys Arg Asp Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser 155 Ala Asn Gly Asn Ser Glu Val Val Lys Leu Val Leu Asp Arg Arg Cys 170 Cln Leu Asn Val Leu Asp Asn Lys Lys Arg Thr Ala Leu Thr Lys Ala 185 Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met Leu Leu Glu His Gly 205 200 The Asp Pro Asn He Pro Asp Clu Tyr Gly Asn The The Leu His Tyr 220 215 Ala Val Tyr Asn Glu Asp Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr 235 230 Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly Leu Thr Pro Leu Leu 250 245 Leu Gly Ile His Glu Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys 265 Lyc Lyc Ale Asn Leu Asn Ale Leu Acp Arg Tyr Gly Arg Thr Ale Leu 28D · 275 Ile Leu Ala Val Cys Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu 300 295 Glu Gln Asn Val Asp Val Ser Ser Gln Asp Leu Glu Arg Arg Pro Glu 315 310 Ser Mat Leu Phe Leu Val Ile Ile Met

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<212> PRT

<213> Nomo sapien

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 Xaa
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 Ser
 Trp
 Gly
 Thr
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 Ser
 Val
 Gly
 Lys
 Lle
 Lys
 Lle
 Lys
 Lys</th

Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro100 105 120

Asp Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Kas Tyr Asn Glu Asp
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Lys Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser
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Lys Asn Lys Val

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345 lle Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile 365 360 Ser Ser Glu Asn Ser Asn Pro Glu Asn Val Ser Arg Thr Arg Asn Lys 380 375 Pro Arg Thr His Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser 395 390 Ser Val Lys Lys Pro Phe Gly Leu Arg Ser Lys Met Gly Lys Trp Cys 405 410 Cys Arg Cys Phe Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly 425 420 Thr Ser Cly Asp His Asp Asp Ser Ala Met Lys Thr Leu Ary Ser Lys Met Gly Lys Trp Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly Lyc Ser Aon Val Gly Ala Ser Gly Aop His Aop Aop Ser Ala Met Lyo 475 Thr Leu Arg Asn Lys Mat Gly Lys Trp Cys Cys His Cys Phe Pro Cys 490 Cys Arg Gly Ser Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp 505 Amp Ser Ala phe Met Glu Pro Arg Tyr Him Val-Arg-Gly-Glu-Amp-Leu-520 Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp 535 Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln 555 Lys Arg Thr Ala Leu Ris Leu Ala Ser Ala Asn Gly Asn Ser Glu Val 570 Val Lys Leu Leu Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn 585 Lys Lys arg Thr Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu 600 Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp 615 Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys 635 Б30 Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys 65D Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys 665 Gln Gln Val Val Lyc Phe Lev Ile Lys Lyc Lyc Ala Amn Lev Aso Ala 68D Lou Amp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cym Cys Gly סטל 695 Ser Ala Ser Ile Val Ser Leo Leo Leo Glo Glo Aso Ile Asp Val Ser 715 710 Ser Gln Asp Leu Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser 730 725 His His Kis Val Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln 745 74Q Met Leu Lys Ile Ser Ser Clu Asn Ser Asn Pro Clu Gln Asp Leu Lys 760 Leu Thr Ser Glu Glu Glu Ser Gln Arg The Lys Gly Ser Glu Ash Ser 780 775 Gln Pro Glu Lys Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp 795 790 Arg Glu Vel Glu Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly

810 Leu Leu Glu Asn Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn 825 Oly Lou Ile Pro Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe B35 840 Pro Amp Am Glu Ser Glu Glu Tyr Him Arg Ile Cym Glu Leu Val Ser 855 Asp Tyr Lys Glu Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn 870 875 Pro Glu Gln Asp Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu 69D Glu Gly Ser Glu Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile 905 Glu Glu Met Lys Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn 920 Leu Thr Asn Gly Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro 935 Pro Arg Lys Ser Arg The Pro Glu Ser Gln Gln Dhe Pro Asp Thr Glu 950 955 Asn Glu Glu Tyr His Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe - · · · 970 Cys Glu Glu Gln Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His 985 Glu Glu Lya Gln Ile Glu Val Val Glu Lya Met Aan Ser Glu Leu Ser 1000 Leu Ser Cys Lyc Lyc Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu 1015 1020 Arg Glu Glu ile Ala Met Leu Arg Leu Glu Leu Asp Thr Met Lys His 1030 1035 Gln Ser Gln Leu Pro Arg Thr Ris Met Val Val Glu Val Asp Ser Met 1045 1050 1055 Pro Ala Ala Ber Ser Val Lys Lys Pro Phe Gly Leu Arg Ser Lys Met 1060 1065 1070 Gly Lys Trp Cys Cys Arg Cys Phe Pro Cys Cys Arg Glu Ser Gly Lys 1080 1085 Ser Asn Val Gly Thr Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr 1095 1100 Leu Arg Ser Lys Met Gly Lys Trp Cys Arg Ris Cys Phe Pro Cys Cys 1110 1115 Arg Gly Ser Gly Lys Ser Asn Val Gly Ala Ser Gly Asp His Asp Asp 1125 1130 Ser Ala Met Lys Thr Leu Arg Asn Lys Met Gly Lys Trp Cys Cys His 1140 1145 1150 Cys Phe Pro Cys Cys Arg Gly Ser Gly Lys Ser Lys Val Gly Ala Trp 1155 1160 1165 Gly Asp Tyr Asp Asp Ser Ala Phe Met Glu Pro Arg Tyr. Hie Val Arg 3175 1180 Gly Glu Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val 1190 1195 Pro Arg Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys 1205 1210 Lys Asp Lys Gln Lys Arg Thr Ala Leu His Leu Ala Ser Ala Asn Gly . 1220 1225 1230 Asn Ser Glu Val Val Lys Leu Leu Leu Asp Arg Arg Cys Gln Leu Asn 1240 1245 Val Lou Asp Asn Lys Lys Arg Thr Ala Lou Ile Lys Ala Val Gin Cys 1255 1260 Gln Glu Amp Glu Cym Ala Leu Met Leu Leu Glu Him Gly Thr Amp Pro

	1265	i				1270	3 .	•			1275					1280
,	LZO,J Agn	Tle	Pro	Aep	Glu	Tyr	Gly	Aen	Thx	Thr	Leu	Kis	Tyr	Ala	Ile	Tyx
					1285	i				1290	} .				7233	
ì	αsε	Glu	Авр	Ĺув	Leu	Met	Ala	Lys	Ala	Leu	Leu	Leu	Tyr	Cly	Ala	Asp
				1300	1				1305	i				7371	J.	
:	Ile	Glu		Lys	Asn	Lye	His	GIA	Leu	Tar	PYO	rea	132	Per	GTA	VET.
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	いっし	o Cue	CVa	Gly	Ser	Ala	Ser	Ile	Val	Ser	Leu	Leu	Leu	Glu	Gln	ABD
						-				3376	•				131	
	11e	Àsp	<b>Val</b>	Ber	ger.	Gln	Asp	Lou	891	Gly	Gln	Thr	Ala	yrg	Jlu	Tyr
				ומנו	ъ.				138	3				2331	_	
	ala	Val	Ser	Ser	Hìs	Hie	HTB	.Val	Ile	CAs	Gln	Leu	Leu	ser -	Авр	Tyr
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	Lye	010	Lys	Gln	M¢ţ	Γ¢π	Lyc	Tre	Ser	Ser	Ģτα	1420	96.F	MOIL	-10	olu '
		141	0				141	 	Gl n	E2111	Ser			Phe	LVB	Gly
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	LVB	Aso	Gly	Авр	Arg	Glu	val	Glu	Gľu	Glu	Met	Lys	Lye	Bia	Glu	ser
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	neA	Aen	Val	GJA	Leu	, ren	Gju	Aen	Leu	Thr	Aen	GTÅ	AUT	TDP -	AIB	GTÅ
		•	147	5			:	148	D 2011 –	×	7	0.5	148	Thr.	Dra	ഭവം
	Авп	Gly	Asp	Aso	Gly	Leu	110	PTO	GIU	wrg	гуя	150	u vra	11,12	210	014
	<u>, , , , , , , , , , , , , , , , , , , </u>	149	0 	The	Dwo	Lan	147	e Chi	Cer	Glu	Glu	TVr	Hia	Arq	Ile	Cys
	150		GIII	PRE	Pro	151	ų Yeri	0.10			151	5		_		1520
	411	J.en	Val	8er	ASD	Tyr	Lva	Glu	Lys	Gln	Met	Pro	Lуэ	Tyr	Ser	Øar
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	Glu	Agn	Ser	Ann	Pro	GJn	Gln	двд.	Lev	Lys	Гел	Thr	Ser	Glu	G31a	Glu
				154	n				154	5				122	v	
	Ser	- Glu			<b>ઉ</b> ՀԱ	GΣγ	ಶಿರಾ	Glu	Asn	GIA	GTD	PTO	156	E TAR	HIG	Ser
	~ _:		155	i5 _,		<b>-</b>		T2P		Nen	2 2 13				Вяп	Phe
	Gln			S GTA		ABD	ப்து 157	E ABD	GLY	app	ura	158	D -			Phe
	7.d., &	157	U. 77.	. (37	(3) 11	Marie	Lva	or Nys	His	Glv	Ser	Thr		Val	Gly	Phs
	1 5 0					159	D				128	<b>'</b>				TODO
	Pro	Glu	ABD	Leu	Thr	Ann	Gly	Ala	Thr	Ala	Gly	Aen	Gly	Asp	Азр	Gly
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	L¢u	Ile	Pro	Pro	Azg	Lyc	Ser	Arg	The	, bro	Q1u	Sex	911	91 <i>n</i>	_ Pb¢	Pro
		•		142	n ·				162	5			٠,	702		100
	ABI	Thr				Glu	Tyr	His	Ser	Аар	GIN	GTU	. ASI 164	r vsh	INF	Gln
			163	15				164	0		. T1-	Tou			. Œ	Tle
	Lys			о Сув	GII	GIV	165	, Ast	TUL	GTA	77.0	166	0	, nor		Ilə
	T 4.	165	Q Site	. MI	. dil	T. 200	. Ogje Tog	PP The	- GD 13	Val	Val	Glu	Live	. Met	Agg	Ser
		. L10	, 47 ž	- 910	. 970	167	, 946 10			, , , , ,	167	15	-, "			1680
	E).	   [	ים	- T.AI	l ger	CVA	Live	LVE	Glu	Lys			Lei	His	Glu	ABN
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	Sei	c Thi	Lei	ı Arq	Gly	. Glu	ille	ala	Met	Leu	Arg	, Leu	ı Glı	ı Let	LAST	Thr
				170	0 .				170	75				7,1		
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			. 17:	15				•								

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Glu Glu Met Lya Lya Hia Glu Ser Asn Asn Val Gly Leu Leu Glu Asn 425 Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro 440 Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Asp Asn Glu Ser Glu Glu Tyr Kis Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu Lys Gln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp 49D 485 Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu 50D 505 Asn Gly Gln Pro Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys 520 Lys His Gly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly 535 - 54Q Ala Thr Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser 555 550 Arg Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr 565 570 His Ser Asp Glu Gln Asn Asp Thr Gln Lyo Gln Phe Cys Glu Glu Gln 585 580 Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln 605 600 Ile Olu Val Val Olu Lys Met Asn Ser Olu Leu Ser Leu Ser Cys Lys 615 520 Lys Glu Lys Asp Ile Leu His Glu Asn Ser Thr Leu Arg Glu Glu Ile 630 635 Ale Met Leu Arg Leu Glu Leu Asp Thr Met Lys Ris Gln Ser Gln Leu

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c211> 671

<212> PRT

<213> Homo sapien

<40D> 38D

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				165					170					175	
Leu	Hie	Leu	Ala 180		: Ala	Aen	Gly	ABN 185		Glu	· Val	Val	. <b>Був</b> 190		Leu
		195	i		Gln		200	1				205	Lys	Arg	
	210				· Val	215					220	_			
225					7 Thr 230					235			_	-	240
				245			_		25D					255	_
		•	260	•	Gly			265	•				270		
	٠.	275			Leu		28D					285		:	•
	290				Lys	295					300		_	_	-
		THY	. MTV	Leu	Ile		Ala	Val	CAR		gīÀ	ger	Ala	Şer	
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				325					330					335	
	-		34 D		Arg			365					350		
	<b>.</b>	355			Ser Aen		360					365		-	
	370				Phe	375					380	*			
385	014	001	0111	9	390		Gry	Der		395	DOI	6111	PLO	oru	400
	Ser	Gln	Glu	Pro	Glu		Ann	Lув	Авр 410		Авр	Arg	Glu	Val 415	
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		435	- 1		Thr		440				••	445		*,	
	450	4.		•	Thr	455					460		_		
	GIII	GII	Tyr	H1s	Arg	Ile	СЛВ	Glu	Len		Ser	Авр	Tyr	Lya	
465 Lys	Gln	Met	Pro	Lys 485	470 Tyr	Ser	Ser	<b>Gl</b> u	A## 490	475 8ex	Aøn	Pro	Glu		480 A≈p
Len	Lva	Len	The		Glu	Glu	Glu			Arn	7.011	27 n	@1 w	495	en.
			500	•	Lys	,		505					510		
		515					520					525			Lys
	<b>53</b> 0			•	Val.	535					540			-	-
545	GIJ		1111	1110	550	GIY	E 140	FIU	G14	555	Deu	IUE	Walf	CLA	560 ·
	Ala	gly	Agn	01y 565	Авр	Aop	OJA		Ile 570	Pro	Pro	Arg	Lys	\$er 575	
Thr	Pro	Glu	Ser 58D		Gln-	Phe	Pro				Aen	Glu	Glu 590		Bio .
ser	Авр	Glu 595		Asn	Дар	Thr	Gln 600		Gln	Phe		Glu 605		Gln	Asn
Thr	Gly		Leu	Hic	qsA	Glu		Leu	Ile	His			Lys	Gln	Ile
	610				7										
			Glu	Lya	Mat	neA	8er	Glu	Leu	ser	Leu	Ser	Ċya	Lys	Lys

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625
                     630
Clu Lys Asp Ils Lou His Glu Asn Ser Thr Lou Arg Glu Glu Ile Ala
                                      65D
Met Leu Arg Leu Glu Leu Asp Thr Met Lys His Gln Ser Gln Leu
             660
                                  665
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                                                                         120
 ccaatatoco aggagaagoa ttggggagtt gggggcaggt gaaggaccoa ggactcacac
                                                                         180
 atcetgggee tecaaggeag aggagagggt ceteaagaag gteaggagga aaateegtaa
                                                                         240
                                                                          251
 caageagtea g
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cactgggagg ggacatectg cagaaggtag gagtgagcaa acaccogctg caggggaggg 180
рададсскіў одрожескуў уддарсьдаў дзадскоскі кідсесаўце скуруаўдаў 240
gggretggag ggegtgagga ggagegaggg ggetgeatgg etggagtgag ggatragggg 300
cagggegoga gatggeetea cacagggaag agagggeece teetgeaggg eeteacetgg 360
gecacaggag gacactgett tteetetgag gagteaggag etgtggatgg tgetggacag 420
aagaaggaca gggeetgget caggtgteca gaggetgteg etggetteee titigggatea 480
gactgcaggg agggagggcg gcagggttgt ggggggagtg acgatgagga tgacctgggg 54D
graduceas geerraces raceragase ereccease erecteasa aretestase 600
coteagtete teccetecae tecatectee atetggeete agtgggteat tetgateaet 660
gaactgacca tacccagece tgeccaegge ectecatgge tecccaatge ectggagagg 720
ggacatotag tengagnagta gteetgaagn ggtggeetet gegatgtgee tgtgggggen 780
gcatcotgca gatggtocog gccotcatco tgotgacotg totgcaggga otgtcotcot 840
ggacottgec cettgtgcag gagetggace etgaagteec etceccatag gecaagactg 900
gageektigkt coototitti gactoooliga esatattott gtiggaagtigi gittitiggaga 960
catttetate tatteetaag agetagaat taeteteaat eatetaeeta egeaatteta 1020
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atcatgggge eetgageeat gtgeeetgee tgaaaageet getgtgtaea eeaaggtggt 1200
gcattacegg aagtggatea aggacaceat egeagecaae eeetgagtge eeetgteeea 1260
cocctacete tagtaaattt aagteeacet eacgitetgg cateaettgg cetttetgga 1320
tgetggacae etgaagettg gaacteaeet ggeogaaget egageeteet gagteetaet 1380
gacetytget ttetgytyty gagteraggy rtyrtagyaa aaggaatggy cagacacagy 1440
tgtatgccaa tgtttetgaa atgggtataa tttegteete teetteggaa caetggetgt 1500
ctotgaagac tictogotca gittoagiga ggacacacac aaagacgigg gigaccaigi 1560
tgtttgtggg gtgcagagat gggaggggtg gggcccaccc tggaagagtg gacagtgaca 1620
caaggtggac actetetaca gatcactgag gataagetgg agccacaatg catgaggcac 1680.
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acacacagoa aggitgaogo totaaacata geocaegoig teetgagago actgagaago 1740 ctagataagg ccgtgagcag aaagaagggg aggateetee tatgttgttg aaggagggac 1800 tagggggaga aactgaaage tgettaatta caggaggttt gttcaggtcc cccaaaccac 1860 cgtcagattt gatgatttcc tagcaggact tacagaaata aagagctatc atgctgtggt 1920 ttattatggt ttgttacatt gataggatac atactgasat cagcasacsa aacagatgta 1980 tagattagag tgtggagaaa acagaggaaa acttgcagtt acgaagactg gcaacttggc 2040.

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gtagetgate cagetgatag aggmactmage caggtggggg cetttccctt togatggggg 2160
goatalooga cagitatiot ofocaagigg agacttaogg acageatata atteteerig 2220
caaggatgta tgataatatg tacaaagtaa ttocaactga ggaagctcac ctgatcctta 2280
gtstocaggs tittitacigs ssstetstas saccastats sastacits ataatisace 2340
tyaagteete agaeetgagg tteeetagag tteaaacaga taeagcatgg tecagagtee 2400
cagatgtaca sasacaggga ticatcacaa atcccatctt tagcatgaag ggtetggcat 2460
ggcccaaggc cccaagtata tcaaggcact tgggcagaac atgccaagga atcaaatgte 2520
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gcagggctgc tgagtcaacc ttttattgta caggggatga gggaaaggga gaggatgagg 2640
descenced gaggattigg titigatetts teatragets stotatgagg chalcontac 2700
Baagaagaat ccagaaatag gggcecattg aggaatgata ctgagcccaa agagcattca 2760
alcatigitt taitigeett etitteaeac eatiggigag ggagggatta ceaeceiggg 2820
gttatgaaga tggttgaaca ccccacacat agcaccggag atatgagatc aacagtttct 2880
tagecataga gatteacage ceagageagg aggaegetge acaecatgea ggatgaeatg 2940
ggggalgder Legggallgg lglgaagaag caaggactgl lagaggdagg elltalagla 3000
acaagacggt ggggcaaact ctgatttccg tgggggaatg tcatggtctt gctttactaa 3060
pttttgagac tggcaggtag tgaaactcat taggctgaga accttgtgga atgcagctga 3120
eccapeteat agaggaagta gecaggtegg ageettteee agteggtetg ggacatatet 3180
ggrasgatti tgtggracte ciggtiacag stacigggge ageasatasa actgaatrit 3240
gttttcagac cttaaaaaaa aaaaaaaaaa aaaagtttt
c210> 383
<211> 154
<212> PRT
<213> Homo sapiens
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Met Ala Gly Val Arg Asp Gln Gly Gln Gly Ala Arg Trp Pro His Thr
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His Cys Phe Ser Ser Glu Glu Ser Gly Ala Val Asp Gly Ala Gly Gln

Lys Lys Asp Arg Ala Trp Leu Arg Cys Pro Glu Ala Val Ala Gly Phe

Pro Leu Gly Ser App Cyp Arg Glu Gly Cly Arg Cln Cly Cyp Cly Gly

Ser Asp Asp Glu Asp Asp Leu Gly Val Ala Pro Gly Leu Ala Pro Ala

Trp Ala Leu Thr Gln Pro Pro Ser Gln Ser Pro Gly Pro Gln Ser Leu 105

Pro Ser Thr Pro Ser Ser Ile Trp Pro Gln Trp Val Ile Leu Ile Thr 120

Blu Leu Thr Ile Pro Ser Pro Ala His Gly Pro Pro Trp Leu Pro Asn

Ala Leu Glu Arg Gly His Leu Val Arg Glu 145 - 1-2 - 1 - 2 - 150 - 150 - 150

DECONORD AND MARRONANTE

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 <211> 557
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 <213> Homo sapiena
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 ggggaagggt cecttttgca ttgccaagtg ccataaccat gagcactact ctaccatggt 180
 tetgeeteet ggeeaageag getggtttge aagaatgaaa tgaatgatte taeagetagg 240
 acttaacett gaaatggaaa gtettgeaat cecatttgea ggateegtet gtgcacatge 300
 ctctgtagag agcagcattc ccagggacct tggaaacagt tggcactgta aggtgcttgc 360
 terreasgee acatretese aggigitate atagigeses egictionit etitatique 420
 cettettatt tatgigaaca actgitigie tittitigia tettititaa actgiaaagi 480
 tcaattgtga aaatgaatat catgcaaata dattatgcga ttttttttt aaagtaaaaa 540
 adaeana adaeanaa
 ₹210> 385
 <211> 337
 <212> DNA
 <213> Homo gapiens
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gtttctctag cagcagatgg gttaggagga agtgacccaa gtggttgact cctatgtgca 120
totcasagee atetgetgte ttegagtacg gacacateat cacteetges ttgttgates 180
aaacgtggag gtgcttttcc tcagctaaga agcccttagc aaaagctcga atagacttag 240
talcagarag gireagitic egeaceaaca cetgetggit ceetglogig giriggatet 300
ctttggccac caattereee ttttecaeat eceggea
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<211> 300
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geocyclogy cocagagggt gggcgcgggg ctgcctctac cggctggcgg ctgtaactca 120
gogacettgg eeegaagget ctagcaagga eeeacegace eeageegegg eggeggegge 180
goggaettig cooggigigt ggggeggage ggaetgegig teegoggaog ggeagogaag 240
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<210> 387
<211> 537
<212> DNA
<213> Homo sapiens
<400> 387
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coccetectg tgccatcatg atcagcacct atgagttogg caaaagette ttccagagge 120
tgaaccagga coggettetg ggeggetgaa agggcaagg aggcaaggac cocgtetete 180
ccaoggatgg ggagaggca ggaggagacc cagccaagtg cettitectc agcactgagg 240
gaggggett gttteeette ceteceggeg acaageteea gggeaggget gteeetetgg 300
geggeccage acttectesg acaceaette treetgetge tecagtegtg gggatestes 360
ettacceacc coccaagite aagaccaaat officagety coccettogt gittecetgt 420
gtttgctgta gctgggcatg tctccaggaa ccaagaagcc ctcagcctgg tgtagtctcc 480
ctgaccettg ttaatteett aagtetaaag atgatgaact teaaaaaaa aaaaaaa
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<211> 520
<212> DNA
<213> Homo sapiens
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tgaggttasa ccagtttgca ttcccctaat gtggasaaag taagaggact actcagcact 120
gittgaagat tgcctcttct acagettctg agaattgtgt tatttcactt gccaagtgaa 180
ggaccccctc cccaacatgc cccagcctac ccctaagcat ggtoccttgt caccaggcaa 240.
ccaggaaact getacttgtg gaccteacca gagaecagga gggtttggtt ageteacagg 300;
acttococca coccagaaga ttagcatocc atactagact catactcaac tcaactagge 360
toatactoaa ttgatggtta ttagacaatt coatttottt ctggttatta taaacagaaa 420
atettteete tteteattae eagtaaagge tettggtate titetgtigg aatgatitet 480
atgaacttgt cttattttaa tggtgggttt tttttctggt
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c211> 365
<212> DNA
<213> Homo eapiens
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cgttgcccca gtttgacaga aggaaaggeg gagettatte mmagtetaga gggagtggag 60
gagttaagge tggattteag atetgeetgg tteeageege agtgtgeeet etgeteeeee 120
aargarttir caaataatet caccagegee tircagetea ggegteetag aagegtetig 180
aagestatgg ceagetgtet tigigitees teleaceege eigieeteas ageigagaet 240
cocaggaaac ottoagacta cottoctotg cottoagoaa ggggcgttgc coacattoto 300
tgagggtcag tggaagaacc tagactccca ttgctagagg tagaaagggg aagggtgctg 160
gggag
<210> 390
<211> 221
<212> DNA.
<213> Homo sapiens
<220>
<221> misc feature
<222> [1]...(221)
<223> n = A,T,C or G
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tacaoggntt ctcatgggtg tggaacatct ctgcttgogg tttcaggaag gcctctggct 120
gricianges teleganensa niegitgeer caninigars naeggaaags cssagetiat 180
traaagtcta gagggagtgg aggagttmag gctggatttc a
<210> 391
<211> 325
<212> DNA
<213> Homo sepiens
<220>
<221> misc_feature
<222> (1)...(325)
<223> n = A_1T_1C or G
<400> 391
```

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tggagcaggt congaggent nortagagen tggggcogan tetgtgnoga tgcangettt 60
ototogogee cageetggag etgeteetgg catotaccaa caatcagnog aggegagcag 120
tagocagggo actgotgoca acagocagto constaccat catginacco qqtqngctot 180
naantingat niceanagee etacceaten tagittetget eteccacegg niceacegee 240
cactgoccas seatcetaca geoagtaced Estecosacs tototaceta coastaceat 300
gagaceteeg getactaeta tgaçe
<210> 392
<211> 277
<212> DNA
<213> Homo sapiens
<220>
<231> misc_feature
<222> (1) ... (277)
\langle 223 \rangle n = A,T,C or G
<400> 392
atatigitta actoritori tratatorit taacattite atggngaang giteacator 60
agtotoactt nggonagngn obootacttg agtotottoo ooggootgnn ocagtnenaa 120
antaccanga accgneatyn ettaanaaen neetgyttiin tyyytinnie aatgaetyea 180
tgcagtgcac caccetgtcc actacgtgat getgtaggat taxagtetea cagtgggcgg 240
ctgaggatec agegergegt cetgtgttge tggggaa
<210 > 393
<211> 566
<212> DWA
<213> Homo sapiens
<400> 393
actagtocag tgtggtggaa ttogoggoog ogtogacgga caggtcagot gtotggotca 60
gtgatetaca ttetgaagtt gtetgaaaat gtetteatga ttaaatteag cetaaaegtt 120
ttgccgggaa cartgeagag acaatgctgt gagtttrcaa ccttagreea trtgreegea 180
gagaaggtet agtitigiees teageattat catgatates ggaetggita citiggitaag 240
gaggggteta ggagatetgt coettttaga gacacettae ttataatgaa gtatttggga 300
9991991116 Caaaagtaga aatgtootgt attoogatga toatootgta aacattitat 360
cattlattaa teatecetge etgtgtetat tattatatte atatetetae getggaaact 420
tretgeetea atgittaetg tgeettigit trigetagit tgigtigitg aaaaaaaaa 480
cattetetge etgagtttta atttttgtee aaagttattt taatetatae aattaaaage 540
ttttgcctat caaaaaaaaa aaaaaa
<210> 394
<211> 384
<212> DNA
<213> Nomo sapiens
<221> misc_feature
<222> (1)...(384)
<223> n - A.T.C or G
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tycaaattny gaccyggcca aggctygact gctygagcyt gtyaaggagc tacagyccna 120
graggaggac ogggetetaa ggagttétaa getgagtete actgtagace ceaaatacea 180
tecesagatt ategggagas aggggggagt sattaceesa ateeggttgg agestgaegt 240
gascatcoag titccigata aggacgatgg gaaccagecc caggaccaaa ttaccatcac 300
A999tacgaa aagaacacag aagotgooag ggatgctata ctgagaattg tgggtgaact 360°
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tgagcagatg gtttctgagg acgt
                                                                    384
 <210> 395
 <211> 399
 <212> DNA
 <213> Homo sapienė
 <400> 395
ggresaartg tgtgacctca ataagacctc gcagatccaa ggtraagtat cagaagtgac 60
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talcagaggt treateatig eggaaatigt ggagtetaag gaaatcatgg cetetgaagt 180
attementer treesgrade Etgagetete talapagete cetamenag geographing 240;
ccagetactt gtetgeaatt gtatetteaa.gaataceetg gccatecett tgactgacgt 300
caeqttctct ttggsaagcc tgggcatctc ctcactacag acctctgacc atgggacggt 360
grageriggt gagarcater aatorraat aaaatgrac
<210> 396
<211> 403
<212> DNA
<213> Homo sapiens
<22D>
<221> misc_feature
<222> (1)...(403)
<223> n - A, T, C or G
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gacattitica acticigete cagetgetga taaaacaaat catgigitta gettgactee 120
agacaaggac aacebgttee tteathaete tetagagaan annaggagtt gttagtagat 180
actomates giggatgest asiriggats titticctas assgnitcet igsascacat 240
taggaeestg gagggeetts tgatesgaat getageatts gteesttgtg etgaageagg 300
gtttagggga gggagtgagg gataaaagaa ggaaaaaaag aagagtgaga aaacctattt 360
atcaaagcag gtgctateac teaatgttag geectgctet ttt
c210> 397
<211> 100
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(100)
<223> n = A,T,C or G
<400> 397
actagindas igiggiggas tingesgede egicgadeta nasnecatet etataqeaaa 60
tecateceeg ctcctggttg qtmacagaat qactqacaaa
<210> 39B
<211> 276
<212> DNA
<213> Homo sapiens
<220×
<221> misc_feature
<222> (1)...(278)
<223> n = A,T,C or G
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```
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goggeogegt egacageagt teogecageg etegeceetg ggtggggatg tgetgeacge 60
ccacctggac atctggaagt cagcggcotg gatgaaagag cggacttcac ctggggcgat 120
teactactot pectogacca strasgagas etssaccoac ascrasgatog acteatcate 180
ctccgggcag cocatccacc tgtggcagtt cctcaaggag ttgctactca agccccacag 240
ctatggccgc ticattangt ggctcaacaa ggagaagg
<210> 399
<211> 298
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(298)
\langle 223 \rangle n = A,T,C or G
c400> 399
acggaggtgg aggaagcgne cotgggateg anaggatggg teetgneatt gacenceten 60
999190009 Catgeagogo atgegogogog gootgegoca oggoategat ogogtgegot 120
ccgagatoga gegeatggge etggteatgg accgeatggg etcegtggag egcatggget 180
ecggcattga gegcattgggc ccgctgggcc tcgaccacat ggcctccanc attgancgca 240
tgggccagae catggagege attggetetg gegtggagen catgggtgee ggeatggg 298
<210> 400
<211> 548
4212> DWA
<213> Homo sapiens
<400> 400
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tgagtetett tittecaegt tiaaggggee atggeaggae tiagagtige gagtiaagae 210
tgcagagggc tagagaatta tttcatacag gctttgaggc cacccatgtc acttatcccg 300
tataccetet caccatocce tigicetecte igaigecocc aagaigeaac igggeageta 360
gttggcccca taattctggg cctttgttgt ttgttttaat tacttgggca tcccaggaag 420
ctitocagig alcicotaco aigggececo circigggal caagecoole coaggecolg 480
tecceagece etectgoece ageceacecg ettgeettgg tgetcagece teccattggg 540
ageaggtt
<210> 401
<211> 355
c212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(355)
<223> n = A,T,C or G
<400> 401
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tgatgtctcc aagtagtcca cottcattta actotttgaa actgtatcat ctttgccaag 120
taagagtggt ggcctattto agctgctttg scaaaatgac tggctcctga cttaacgttc 100
tataaatgaa tytyetysay caaaytyeee atyytyyegy egaagaagan aaagatyty 240
tttgttttgg actctctgtg gtcccttcca atgetgnggg tttccaacca ggggaagggt 300
```

```
cccttttgca ttgccaagtg coataaccat gagcactact ctaccatggn totgc
                                                                    355
 <210> 402
 <211> 407
 <212> DNA
 <213> Homo sapiens
 <220>
 <231> misc_feature
 <222> (1)...(407)
 <223> n = A,T,C or G
 <400> 402
atggggcaag ctggataaag aaccaagacc cactggagta tgctgtcttc aagaaaccca 60
teteacatge ggtggeatac ataggetema antamaggam tggagamama tatttemage 120
assiggaasa cagasaaaag raggigiigo actoriacti irigarasaa cagactaigo 180
gastasagat asassagaga aggacattac asaggtqqtc ctqacctttq atasatctca 240
tigettyata ceaacetggg eigititaat igeceaaaee aaaaggataa tiigeigagg 300
ttgtggaget teteccetge agagagtece tgatetecca aaatttggtt gagatgtaag 360.
gnigatitig eigaceacte cittietgas gittiactes ittecas
<210> 403
<211> 303
<212> DNA
<213> Homo Bapiens
<220>
<221> misc feature
<222> (1) ... (303)
4223> 0 - A,T,C or G
<400> 403
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tagagaacaa gacctactca gtcatgaaca aaaaggcaga caccaacatg gatctcatgg 180
gggattggat attgtaatta tagagcagga agatgacagt gatcgtcatt tggcacaaca 240
tettaacaac gacegaaace cattatttac ataaacetec atteggtaac catgttgaaa 300
gga
<210> 404
<211> 225
<212> DNA
<213> Homo sapiene
<400> 404
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attgttaatg cactcattta cetttacatg gtgaaagtte tetettgate etacaaacag 120
acattiteca cicgigitte catagitgit aagigtatea gaigigitgg gesigigaat 180
ctccaagtgc ctgtgtaata aataaagtat ctttatttca ttcat
c210> 405
c211> 334
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) ... (334)
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<211> 250

```
<223> n = A,T,C or G
 <400> 405
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 ttcaatacac ctccccccat agtgaatcag cttccagggg gtccagtccc tctccttact 120
 teatececat coratgeraa aggaagaree tereteettg getearager tertetagge 180
 tteccagtge ctrcaggaca gagtgggtta tgttttcage tecatecttg ctgtgagtgt 240
 etggtgeggt tgtgeeteea gettetgete agtgetteat ggaeagtgte cageecatgt 300
 cactetecae teteteanng tggateceae coet
 <210> 406
 c2115 216
 <212> DNA
 <213> Homo sapiens
 <22D>
 <221> misc_feature
 <222> (1)...(216)
 <223> n + A,T,C or G
 <400> 406
 tttcatacct-aatgagggag ttganatnec stnnaaccag gasetgestg gatctcaang so
 gaascasans recaatasan toggagtgge agactgacaa etgtgagaca tgcacttget 120
 achaaacaca aattinatgt tgcaccottg titctacacc tgtgggttat gacaaagaca 180
 actyccaaag aatnttcaag aaggaggact gccant
 <210> 407
 <211> 413
 <212> DNA
 <213> Homo sapiens
 4400> 407
gobgaottyc tagtatrato tycattoatt gaagcaraag aarttcatgo ottgactoat 60
gtesatgces taggattess essteeattt gatatcacat ggasscagec assazatatt 120
gtacaacatt gcacccagtg tcagattcta cacctggcca ctcaggaagc aagagttaat 180
cocagagged tatgtoctaa tgtgttatgg casatggatg teatgcacgt acettcattt 240
ggammattgt catttgtccm tgtgacagtt gatacttatt cacatttcat atgggcaacc 300
Egccagacag gageasgret receatgtta asagacattt attatettgt titteetgtea 360
tgggagttcc agaaaaagtt aaaacagaca atgggccagg ttctgtagta aag
<210> 408
<211> 183
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) ... (183)
<223> n = A,T,C or G
<400> 408
ggagetngee etcaatteet ceatntetat gttanestat ttaatgtett ttgmnattaa 60
tnettaacta getaateett aaagggetan ntaateetta aetagteest esattgtgag 120
cattatectt coagtatton cottonnett tattactor trootggota cocatgiact 180
<210> 409
```

> CHARLETTE COMMERCIAL

```
State of the state
                                                                                                                        <212> DNA
    <213> Romo sapiens
    <220>
    <221> misc feature
    <222> (1) ... (250)
    \langle 223 \rangle n = A,T,C or G
    <400> 409
    eccaegeaty ataagetett tatttetgta agteetgeta ggaaateate aaatetgaeg 60
    graftriggg ggacctgaac asaccicctg taattaatca gctttcagtt tctcccccta 120
   gtreeteett caacaacata ggaggateet escettetti etgeteacgg cettatetag 180 .
    getteecagt geecceagga cagegtggge tatgtttaca gegenteett getggggggg 240
   ggcontatge
                                                                                                                                                                       250
    <210> 410
    <211> 306
   <212> DMA
   <213> Homo sapiens
   <220>
   <221> misc_feature
   <222> {1}...(306)
   \langle 223 \rangle n = A_1T_1C \text{ or } G
   <400> 410
   ggctggtttg caagaatgaa atgaatgatt ctacagctag gacttaacct tgaaatggaa 60
   agtettgeaa teccattige aggateegte tgtgeacatg cetetgtaga gageageatt 120
   cccagggacc ttggaaacag ttggcactgt aaggtgettg etecccaaga cacatectaa 180
   auggtyttgt aatggtgdaa accyrttert betttattge ecettettat blatgtgdae 240
   nactggttgg ctttttttgm atcttttta aactggaaag ttcaattgng aaaatgaata 300
   tentge
   <210> 413
   <211> 261
   <212> DNA
   c213> Homo gapiens
   <220>
  <221> misc_feature
  <222> (1) ... (261)
   \langle 223 \rangle n = A,T,C or G
  <400> 411
  agagatatin citagginaa agitcataga gitcocatga actatatgac tggccacaca 60
  ggatetettg tatttaagga eteegagatt tegeetgage aggattagat aaggetgtte 120
  tttaaatgtc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
  aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
  cttctctcma ggngaggcam a
                                                                                                                                                                     261
  <210> 412
  <211> 241
  <212> DNA
  <213> Homo sapiens
  <220>
 <221> misc feature -
<222> (1) ... [241]
```

<220>

```
<223> n = A,T,C or G
<400> 413 -
gttcaatgtt acctgacatt tctacaacac cccactcacc gatgtattcg ttgcccagtg 60
ggaacatacc agcctgaatt tggaasaaat aattgtgttt cttgcccagg saatactacg 120
actgactttg atggctccac aaacataacc cagtgtaaaa acagaagatg tggaggggag 180
ctgggagatt tcactgggta cattgaattc ccasactacc cangcaatta cccagccaac 240
c210> 413
c211> 231
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> |1)...(231)
<223 \geq n = A, T, C or G
<400> 413
aactottaca atocaagtga eteatotgtg tgottgaate officeactg toteatelee 60
rtcatccaag "tttctagtar" cttrtctttg "ttgtgsagga" taatcaaact "gaacaacaaa "120"
aegtitacio tecteatity gaacciaaaa actetetiti teetygytet gagggeteea 180
agaateettg aateanttet cagateattg gggacacean atcaggaace t
<210> 414
<211> 234
<212> DNA
<213> Homo sapiens
<400> 414
actybecaty asycactysy cayaayetyy aggebeaacy caccayacae bemcaycaas 60
qatqqaqctq aaaacataac ccactctgtc ctggaggcac tgggaagcct agagaaggct 120
gtgagccaag gagggagggt cttcctttgg catgggatgg ggatgaagta aggagaggga 180
etggaccece tggaagetga tteactatgg ggggaggtgt attgaagtee teca
<21D> 415
<211> 217
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(217)
<223> n = A,T,C or G
<400> 415
geataggatt aagactgagt atctttttta cattettta actttctaag gggcacttct 60
casaacacag accapgtage sasteteese tgetetaagg nteteseese caetttetes 120
carctageaa tagtagaatt cagteetaet tetgaggeea gaagaatggt teagaaaaat 190
antqqattat aaasaatsac aattaagaaa aataatc
<210> 416
<211> 213
<212> DNA
<213> Romo sapiens
```

```
<221> misc feature
 <222> (1)...(213)
 <223> n = A,T,C or G
 <400> 416
 atgrataint saagganact gootogotti tagaagacat otggnotgot ototgoatga 60
 ggcacageag taxagetett tgatteecag aateaagaac teteceette agactattae 120
 ogaatgcaag gtggttaatt gaaggccact aattgatgct caaatagaag gatattgact 180
 atattggaac agatggagtc tctactacaa aag
 <210> 417
 <211> 303
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> {1}...(303)
 \langle 223 \rangle n = A,T,C or G
 <400> 417
nagicticag geceatragg gaagticaca riggagagaa gicatacata igtacigiat 60
gtqggaaagg ctttactctg agttcaaatc ttcaagccca tcagagagtc cacactggag 120
aguagecata caaatgemat gagtgtggga agagetteng gagggattee cattatemag 180
 ttcatctagt ggtccacaca ggagagaaac octataaatg tgagatatgt gggaagggct 24D
trantraaag tiegtatett caaatecate ngaaggneea cagtatanan aaacettita 300
agt
 <210> 418
<211> 328
<212> DNA
<213> Homo sagiens
<220>
<221> misc_feature
<222> (1)...(32B).
<223>.n = A,T,C or G
<400> 418
tttttggcgg tggtgggca gggacgggac angagtetca ctctgttgcc caggctggag 60
tgcacaggca tgatctcggc tcactacaac ccctgcctcc catgtccaag cgattcttgt 120
geoteagest tecetgiage tagaattasa ggeacatgee accacacea getagtittt 180
gtatttttag tagagacagg gtttcaccat gttggccagg ctggtctcaa actcctnacc 240
teagnggtea ggrtggtete assetectgs reteaagtga tetgereare teageeteer 300
aaagtgctan gattacagge cgtgagec
                                                                    328
<210> 419
c211> 389
<212> DNA
<211> Homo sapiens
<220>
<221> misc_feature
<222> {1}...(389)
<223> n = A, T, C or G
c400> 419
cotoctcaag acggootsts stocscotee oggozaceaa gazgootsca stoccatats 60
```

```
acceptgage eatggactgg agentgasag geageghaea contgetout gatettgetg 120
ottgtetort rtelgigget coalicatag cacagilgit gracigagge tigigagge 180
cgagcaaggo caagotggot caaagagcaa coagtcaact otgocacggt gigccaggca 240
orgaticies agecaccaas steasteget ecogeaaatg geacateagt tettetaces 300
teaaggtagg accasaggge atotgetttt ctgaagteet etgetetate agecateseg 360.
tggcagccac tenggetyte tegacgcgg
<210> 420
c211> 40B
<212> DNA
<213> Romo sapiens
<400> 420 1
gttectecta actectgoca gaaacagete tecteaacat gagagetgea eccetectee 60
tggccagggc agcaagcett agcettgget tettgtttet getttttte tggetagace 120
gangtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
gtoccattga cacctttccc actgacccca taaaggaatc ctcatggcca caaggatttg 240
gocaactoac ceagetggge atggageage attatgaact tggagagtat ataagaaaga 300
gatatagasa attotogaat gagtootata aacatgasca ggtttatatt ogaagcacag 360
acyttoaccy gactttgaty aagtgetaty acaaacetgy caageccy
<210> 421
<211> 352
<212> DNA
<213> Homo sapiens
<220×
<221> misc feature
<2225 {1}...(352)
<223> n = A, T, C or G
c400> 421
goteaasaat ottittaotg ainggoatgg otacacaato aitgaotati acggaggoca 60
gaggagaatg aggeetggee tgggageest gtgeetaeta naageacatt agattateea 120
ttcactgaca gaacaggtot tttttgggto cttottotoc accaenatat acttgcagto 180
ctccttcttg aagattcttt ggcagttgtc tttgtcataa cccacaggtg tagaaacaag 240
ggtgcaacat gaaatttetg tttcgtagea agtgcatgte teacaagttg gcangtetge 300
cacteogagt thattgggtg titgttteet ttgagateea tgeattteet gg
<210> 422
<211> 337
<212> DNA
<213> Homo sapiens
atgocarcat getggeaatg cagegggegg tegaaggeet gestateeag eecaagetgg 60
cgatgatcga cggcaaccgt tgcccgaagt tgccgatgcc agccgaagcg gtggtcaagg 120
gcgatagcaa ggtgccggcg atcgcggcgg cgtcaatect ggccaaggte agccgtgate 180
gtgasatggc agetgtcgaa ttgatctacc egggttatgg catcggeggg cataagggct 240
atecgacace ggtgcacetg gaageettge ageggetggg geogacgeeg attcacegae 300
gettetteeg eeggtaogge tggeetatga aaattat
<210> 423
<211> 310
<212> DWA
<213> Homo Bapiena
<220>
```

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                                                                                                       <221> misc_feature
  <222> (1)...(310)
  <223> n = A,T,C or G
  c400> 423
  geteaaaaat ettettaetg atatggeatg getacacaat cattgactat tagaggeeag 60
  aggagaatga ggeetggeet gggageeetg tgeetaetan aageneatta gattateeat 120
  tractgacag aacaggtett ttttgggtee ttetteteca ccaegatata ettgeagtee 180
  tecttettya agaitetteg geagtigiet tigtestaar eeseaggigt ansascaagg 240
  gtgcaacatg asatttetgt ttegtageaa gtgcatgtet caragttgte asgtetgeec 300
  tccgaqttta
  <210> 424
  <211> 370
  <212> DNA
  <213> Homo sapiens
  <220>
  <221> misc feature
  <222> (1)...(370)
  <223> n - A,T,C or G
  <400> 424
 geteaaaaat etittaetg ataggeatgg etacacaate attgaetatt agaggeeaga 60
 ggagaatgas geetggeetg ggageeetgt geetactaga ageaeattag attatematt 120
  cactgacaga acaggictit titigggicct bottotocac cacgatatac tigcagtoct 180
  cettettgaa gattetttgg cagttgtett tgteataace cacaggtgta gaaacafeet 240
 ggttgaatet eetggaacte ceteattagg tatgaaatag eatgatgeat tgeataaagt 300
  racgaaggtg gcaaagatca caacgctgcc raggamaaca ttcattgtga taagcaggac 360
 tecgtegacg
 c2105 425
 <211> 216
 <212> DNA
 <213> Homo sapiens
 <22D>
 <221> misc feature
 <222> (1)...(216)
 <223> n - A,T,C or G
 <400> 425
 sattgctatn nttlattitg cractcases testtacces sessesses intressigs so
 taacaacnea acateaaggn aaananaaca ggaatggntg actntgcata aatnggeega 120
anattateca ttaintiaag ggtigactic aggntacage acacagacaa acatgercag 180
gaggntntca ggacogotog atgintintg aggagg
                                                                                                                                              216
<210> 426
<211> 596
<212> DNA
<213> Homo sapiens
<400> 426
ettecagiga ggataaccet gitgeeccigi geogaggite tecattagge telgatigat 60
tggcagtcag tgatggaagg gtgttctgat cattccgact gccccaaggg tcgctggcca 120
getetetgtt tigetgagtt ggeagtagga ectaatitgt taattaagag tagatggtga 180
getgteettg tattttgatt aacctaatgg cetteerage acgaetegga tteagetgga 240
gacatcacgg caacttttaa tgaaatgatt tgaagggcca ttaagaggca cttcccgtta 300
```

```
ttaggeagtt catctgcact gataacttot tggcagotga gotggtogga getgtggood 360
 assequence tiggettitig gittigagat acasetetta atetitiagi catoritigag 420
 ggtggatggc cttttcaget ttaacccaat ttgcactgcc ttggaagtgt agccaggaga 480
 atacactcat atactostys yortagasys cacagosgat steattyste tactgootga 540
 gtocogotyg toccatocca ggacottoca toggegagts cotgggagco cgtyct
 <210> 427
 c211> 107
 <212> DNA
 <213> Homo sapiens
 <22Q>
 <221> misc_feature
 <222> {1}...(107)
 <223> n = A,T,C or Q
 <400> 427
 9aagaattoa agttaggitt attoaaaggg ottacngaga atootanaco caggnocoag 60
 congresses scarteness detrotatt destacced creaded
 <210> 428
 <211> 38-
 <212> DNA
 <213> Bomo sapiena
 <221> misc_feature .
 <222> (1) ... (38)
 <223> n = A,T,C or G.
<400> 428
 gaactteena anaangaett tatteaetat titaeatt
                                                                    ЭB
 <210> 429
 <211> 544
 <212> DNA
 <213> Homo sapiens
 <4DD> 429
 ottbycbyga oggaataaaa ytgyaogcaa ycabyacctc ctyatyayyy cyctycattt 60
attgaagage ggetgeagee etgeggttea gattaaaate egagaattgt atagaegeeg 120
Atatecaega actetigaag gaettietga titatecaea ateaaateat eggittieag 180
tttggatggt ggctcatcac ctgtagaacc tgacttggcc gtggctggaa tccactcgtt 210
geotheract teagttacae cheacteace absorbered gitiggithety typingettea 300
agatactéag coracattig agatgoagos groateteco coaattooto rigitocates 360
tgatgtgcag ttamamatc tgccctttta tgatgtcctt gatgttctca tcaagcccac 420
gagtttagtt caaagcagta ttcagcgatt tcaagagaag ttttttattt ttgctttgar 480
acctcaacaa gttagagaga tatgcatate cagggatttt ttgccaggtg gtaggagaga 540
ttat
<210> 430
<211> 507
<212> DNA
<213> Homo sapiens
<220>
<221> miso_feature
<222> (1)...(507)
```

<223> n = A, T, C or G

```
<400> 430
 cttatenesa tggggetece saacttgget gtge&gtgga macteogggg gmattitgam 60
 gaacactgac accestotto caccecgaca ctetgattta attgggetge agtgagaaca 120
 gascatcaat ttaaaaagct gcccagaatg tintcctggg cagcgttgtg atctttgccn 180
 cettegtgae titatgeaat geatestget atttestace taatgaggga gtteeaggag 240
 atteaaceag gatgitteta enecigiggg tiatgacaaa gacaacigee aaagaainti 300
 caagaaggag gactgcaagt atatogtggt ggagaagaag gacccaaaaa agacctgttc 360
 tgtcagtgaa tggataatet aatgtgette tagtaggeac agggeteeca ggecaggeet 420
 cetteteete tggcetetes tagtesatge ttgtgtagee stgcctatea gtssaasgat 480
 ttttgagcaa aassasaasa aaaaaaa
 <210> 431
 <211> 392
 <212> DNA
 <213> Komo sapiens
<220> .
<221> misc_feature
<222> (1)...(392)
<223> n = A, T, C or G
<400> 431
gaaaattcag aatggataaa aacaaatgaa gtacaaaata tttcagattt acatagcgat 60
aaacaagaaa gcacttatca ggaggactta caaatggaag tacactctan aaccatcatc 120
tatcatggct amatgtgaga ttagcacage tgtattattt gtacattgca amcacctaga 180
asgagatggg aascasaato coaggagttt tgtgtgtgga gtootgggtt ttooaacaga 240
catcattoca goattotgag attagggaga ttggggatca ttotggagett ggaatgttea 300
acaaaagtga tgttgttagg taaaatgtac aacttctgga tctatgcaga cattgaaggt 360
gcaatgagto tggottttac totgotgttt ot
<210> 432
<211> 387
<212> DNA
<213> Homo sapiens
<22D>
<221> misc_feature
<222> (1) ... [387}
<223> n = h, T, C or G
<400> 432
ggtatconta cataatcaaa tatagotgta gtacatgttt toattggngt agattaccac 60
aaatgraagg caacatgigt agaictritg tottateett tigictataa tacigtatig 120
ngtagtrcaa geteteggna gtecageeae tgngaaacat geteeetta gattaacete 180
gtggacmetn tigitignatt gictgaactg tagngcectg tattitigett etgictgnga 240
attotyttye ttotygggea tttccttgng atgcagagga ccaccacaca gatgacagca 300
atotgaatty ntocaatoac agotgogatt magacatact gmaatogtac aggmooggga 360
acaacgtata gaacactgga gtccttt
<210> 433
<211> 281
<212> DWA
<213> Homo sapiene
<220×
<221> misc feature
```

```
<222> (1)...(281)
  <223> n - A,T,C or G
  <40D> 433
  ttcaactage anagaanact gettcagggn gtgtaaaatg aaaggettee acgeagttat 60
  ctgattamag aacactaaga gagggacaag gctagaagcc gcaggatgtc tacactatag 120
  caggemetat ttgggttgge tggaggaget gtggaaaaca tggagagatt ggegetggag 180
  ategeogtgg ctatteeten tigntattae accagngagg nictetgint geccactggt 240
  thnessaccg ntatacasta atgetagest aggacacacs t
  <210>. 434
  <211> 484
  <212> DNA
  <213> Homo sapiens
  <400> 434
 tittaaaata agcatttagt geteagteen tartgagtan tetttetete meeteetets 60
 aatttaatto tttoaacttg caatttgcaa ggattacaca tttoactgtg atgtatattg 120
 tyttgcaaaa aaaaaaagt gtetttgttt aaaattaett ggtttgtgaa tecatettge 180
 titticecca tiggaacteg teattaacce atcictgaac togtagaaaa acatetgaag 240
 agctagteta tragcatetg araggtgaat tggatggtte tragaaccat ttraccaga 300
 cagootgttt ctatoctgtt taataaatta gtttgggtte totacatgca taacaaaccc 360
 tgetecaate tgteacataa aagtetgtga ettgaagttt agteageace eccaecaaac 420
 titattttte tatgtgtttt ttgcsacata tgagtgtttt gesastasag tacccatgte 480
 ttta
 <210> 435
 <211> 424
 <212> DNA
 <213> Homo sapiens
 <40D> 435
 gegeogetea gageaggtea etttetgeet tecaegteet eetteaagga agereeatgt 60
 ggstagettt caatalegea ggttettaet cetetgeete tataagetea aacecaepaa 120
 cyatcyggea agraaaccee eteretegee gaetteggaa etggegagag tteagegeag 180
 atgggcctgt ggggaggggg caagatagat gagggggagc ggcatggtgc ggggtgaccc 240
 ettsgagaga sgaaaaasge cacaagaggg getgecaceg ceactaacgg agatggceet 300
ggtagagace tttgggggte tggaacetet ggaetececa tgetetaaet eccaeaetet 360
getateagae arttaeactt gaggatttte tetgttttte actegeaata aatteagage 420
<210> 436
<211> 567
<212> DWA
<213> Homo sapiens
<22Q>
<221> misc_feature
<222> {1} ... (667)
\langle 223 \rangle n = A,T,C or G
<400> 436
accttgggaa nactotcaca atataxaggg togtagactt tactccaaat tccaaaaagg 60
teetggeest glasteetga asgittieee asggtageta taassteett ataagggtge 120
agociettet ggaatteete tgattteaaa gteteaetet caagttettg aaaacgaggg 180
cagttectga aaggcaggta tagcaactga tettcagaaa gaggaactgt gtgcaccggg 240
atgggotgce agagtaggat aggattecag atgotgacae ottotggggg aaacaggget 300
gocaggitty testageset catesaagte eggteanogt etgtgotteg satatasace 360
```

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Sand of the William Agreement in the course of
 tgttcatgtt tataggacto attomagaat tttctatato totttettat atactetca 420
 agticataat gotgeteeat geccagetgg gigagitigge caaateetig tggccatgag 480
 gatteettta tggggteagt gggaaaggtg teaatgggae tteggtetee atgeegaaae 540
 accasagtes casacticas etectigget agtacactic ggtetagees gassassage 600
 egeaacaaga agccaagget aaggettget geeetgeeag gaggaggggt geagetetea 660
 tgttgag
 <210> 437
 <211> 693
 <212> DNA
 <213> Homo sapiens
 <400> 437
chargictes acceleatti traggraagg asterraagt cessagetat tasgigacte so
acaccagccag gtaaggaaag ciggatiggc acactaggac totaccatac cgggttitgt 120
taaageteag gttaggagge tgataagett ggaaggaaet teagaeaget tttteogáte 180
ataaaagata attettagee catgitette tecagageag acetgaaatg acagcacage 240
aggtactect etattttese ecetettget tetactetet ggeagteaga eetgtgggag 300
gccatgggag asagcagoto totggatgtt tgtacagato atggactatt ototgtqsac 360
cattleteca gettacceta geteteacta tteggeggae agecageate tttagettte 420
Attigagett ctgtctgtct tcagtagagg asscrittge tcttcacact tcacstctga 480
acacctaact gctgttgctc ctgaggtggt gaaagacaga tatagagctt acagtattta 540
tectattet aggeactgag ggetgtgggg tacettgtgg tgecaaaaca gateetgttt 600
taaggacatg tigeticaga gatgtetgta actatetggg ggetetgtig getetttaee 660
ctgcatcatg tgctctcttg gctgaaastg acc
<210> 438
<211> 360
<212> DNA
<213> Homo sapiens
<400> 438
etgettatea caatgaatgt teteetggge agogttgtga tetttgecae ettegtgaet 60
ttatgeaatg cateatgeta titeataeet aatgagggag ticeaggaga ticaaccagg 120
atgittetae accigigggi taigacasag acaacigeea aagaalette aagaaggagg 180
actgraagta tatctggtgg agaagaagga cocaaaaaag acctgttotg toagtgaatg 240
gataatctaa tgtgetteta gtaggeacag ggeteecagg ceaggeetea tteteetetg 300
goototaata gtosetaatt gtgtagocat gootatoagt easaagattt ttgagoaaac 360
<210> 439
<211> 431
<212> DNA
c213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G
<40D> 439
gtteetmita actectgeca gazacagete tecteaacat gagagetgea eccetectee 50
tggccagggc agcaagcett agcettgget tettgtttet getttette tggctagace 120
gaagtgtact agecaaggag ttgaagtttg tgaetttggt gttteggeat ggagacegaa 100
gtoccattga cacetttecc actgacceca taaaggaate etcatggcca caaggatttg 240
growertose coagetggge stggsgrage attatgaset tggsgagtat staagaasga 300
gatatagana attettgaat gagteetata aacatgaaca ggtttatatt egaageacag 350
acgitgaccy gactitgaty agtyctatya caaacciggo agcocytoga cycygogog 420
aatttagtag t
```

```
<210> 440
 <211> 523
 <212> DNA
 <213> Homo sapiens
 <400> 440
 agagataaag ettaggteaa agtteataga gtteeeatga aetatatgae tggeeacaeá 60
 ggatchtttg tathtaagga ttotgagatt ttgottgage aggattagat aaggotgtte 120
 tttaaatgtr tgaaatggaa regatticaa assassacce cacsstctag ggtgggaaca 180
 aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
 ctteteteaa ggagaggeaa agamaggaga tacagtggag acatetggaa agttttetee 300:
 actggazaac tgctactate tgtttttata tttetgttaa aatatatgag gctacagaac 360
 taasaattaa aacctotttg tytooottgy tootggaaca totatyttoo tellaaagaa 420
 aceaeeatra eectttareg eaagattiga igielgieet acatalagca gcirtigaag 480
 tatatatate atageaaata agteatetga tgagaaeaag eta
 <210> 441
 <211> 43D
 <212> DNA
 <213> Romo sapiens
 <400> 441
 gittectecta actoctgoca gaaacagete tectcaacat gagagetgea eccetectee 60
 togddaggge ageaageett ageettgget tettgtttet getttttte tggetagace 120
 qaagtgtact agccaaggag ttgaagtttg tgactttggt gtttoggcat ggagaccgaa 180
 gioccattga caccittoco actgaccoca tadaggaato otcatggoca caaggatitg 240
 geoazeteze ceagetggge atggageage attatgzaet tggagagtat atzzgazaga 300
gatatagasa attettgaak gagteetata aacatgaaca ggtttatatt egaageacag 360
 acgitgaccg gactitgatg agigotaiga caaaceiggo agoobgioga ogoggoogog 420
aatttagtag
 <210> 442
 <213> 362
<212> DNA
<213> Homo sapiens
<900> 442
ctaaggaatt agtagtgtte ceateacttg titggagtgt getattetaa aagattitga 60
ttteetggaa tgacaattat attttaactt tggtggggga aagagttata ggaccacagt 120
cttcacttct gatacttgta mattaatctt ttattgcact tgttttgacc attamgctat 160
atgittagaa atggittatti tatggaaaaa tiagaaaaat totgataata gigcagaata 240
aatyaattaa tyttttactt aatttatatt gaartytras tyaresatea aaattritte 300
tgattatttt ttgttttcat ttaccagest asaesctaeg asttessegt ttgattacag 360
tc
<210> 443
<211> 624
<212> DNA
<213> Homo sapiens
<220≥
<221> misc feature
<222> (1)...[624].
\langle 223 \rangle n = A,T,C or 0
<400> 443
tttttttttt gcaacacaat atacatcaca gtgaaatgtg taatccttgc aaattgcaag 60
```

```
ttgaaagaat taaattcaga ggagggaga gaaagagtac tcagtaggga ctgagcacta 120
 astgettatt ttaasagasa tgtaaagage agaaageaat teaggetace etgeetttg 180
 tgetggetag tactceggte ggtgtcagea gcacgtggca ttgaacattg caatgtggag 240
 cccsssccac agsamatggg gtgssattgg ccsactttct attascttgg cttcctgttt 300
 tataaaatat tgtgaataat atcacctact tcaaagggca gttatgaggc ttaaatgaac 360
 taacgootac aaaacactta aacatagata acataggtgo aagtactatg tatotggtac 420
 atggtaaaca teettattat taaagteaac getaaaatga atgtgtgtge atatgetaat 480
 agtacagaga gagggcactt aaaccaacta agggcctgga gggaaggttt cctggaaaga 540
 ngatgettgt getgggtees satettggte tactstgsee ttggeesaat tetttsaart 500
 ttgtccctst ctgctsaaca gate
 <210> 444
 <211> 425
 <212> DNA
 <213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(425)
<223> n = A,T,C or G
<400> 444
gcacateatt nntettgcat tetttgagaa taagaagate agtaaatagt teagaagtgg 60
gaagettigt coaggeeigt gigtgaaced aatgititge tiagaaatag aacaagtaag 120
ttrattgrta tagcatasca casastttgc atsagtggtg gtragcsast ccttgastgc 180
tgettaatgt gagaggitgg taaaateett tgtgedacae tetaaeteee tgaatgittt 240
gotgtgotgg gacotgtgca tgccagacaa ggccaagotg gotgaaagag caaccagoca 300
cetetscaat etgecacete etgetsgeas gattigtitt tgeateetge gaagaqeea 360
ggaggcacca gggcataagt gagtagactt atggtcgacg cggccgcgaa tttagtagta 420
gtaga
<210> 445
<21.1> 414
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(414)
<223> n = A, T, C or G
<400> 445
catgittatg nititiggatt actitiggges cetagigtit classicgic tatesticit so
ttctgttttt caasagcaga gatggccags gtctcaacaa actgtatctt caagtctttg 120
tgazattett tgeatgtgge agattættgg atgtagttte etttaactag catataaate 180
tggtgtgttt cagatamatg aacagcaama tgtggtggam ttaccatttg gmacattgtg 240
astgassat tgtgteteta gattatgtaa caastaacta ttteetaace sttgatettt 300
agattittat aatectacte acaaatgaet aggettetee tettgtattt tgaageagtg 360
tgggtgctgg attgatesaa aassassaag tcgscgcggc cgcgsattta gtag
<210> 446
<211> 631
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(631)
```

```
<223> n = A, T, C or G
c400> 446
acsasttags ansaagtgoo agagaacaco acatacottg tooggaacat taraatgoot 60-
tetgeatgea tgggmagtgt gageatteta teaatatgea ggageeatet tgeaggtgtg 120
atgotggtta tactggaces cactgtgass sassggacta cagtgttcta tacgttqttc 180
coggiocity acgaitteay tatgecttas togcagotyt gattggsaca attoagatty 240
chatcately totografic cictocatca caagggccaa actitaggta atagcattag 300
actgagattt gtaaacttte caacetteca ggaaatgeee cagaageaac agaatteaca 360
gacagaagca aaatacaggg cactacagtt cagacaatac aacaagagcg tocacgaggt 420
taatetaaag ggagdatgtt teacagtgge tggaetaceg agagettgga etacacaata 480
castattata sacasassa tassacaasa satctacaca tettecette catttetest 540
ABICLACACC BAIGAABBCA IGLACIACAG CLAIATTIGA TIAIGEAIGG BIALATTIGA 600
aatagtatac attgtcttga tgttttttct q
<210> 447
<211> 585
<212> DNA
<213> Homo sapiene
<220>
<221> misc feature
<222> (1)...(585)
<223> n = A,T,C or G
<400> 447
cottgggaaa antntcacaa tataaagggt cgtagacttt acticaaatt ccaaaaaggt 60
cctggccatg taatcctgaa agttttcccs aggtagctat aasstcctta taagggtgcs 120
gootottotg gaattootot gatttoaaag totoactoto aagttottga aaacgagggc 180
agtteetgaa aggeaggtat ageaactgat etteagaaag aggaactgtg tgeaeeggga 240
tgggctgcca gagtaggata ggattccaga tgctgacacc ttctggggga aacagggctg 300
ccaggitigt catagracic atcaaagicc ggicaacgic igigciicga ataimacci 360
gtteatgttt ataggaetea tteaagaatt ttetatatet etttettata taeteteeaa 420
gttestaatg ctgctccatg cecagetggg tgagttggcc aastccttgt ggccatgagg 480
atteetttat ggggteagtg ggasaggtgt caatgggaet teggteteea tgeegaaara 540
ccaaagtcac asacttcaac teettggcta gtacacttcg gteta
<210> 448
<211> 93
<212> DNA
<213> Komo papícos
<220>
<221> misc feature
<222> (1)...(93)
<223> n - A,T,C or G
<400> 44B
tgctcgtggg tcattctgan mnccgaactg accntgccag ccctgccgan gggccnccat 60
speceectag tycectygag aggangggge tag
<210> 449
<211> 706
<212> DNA
<213> Homo sapiens
<220>
```

<221> misc feature

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<222> (1)...(706)
<223> n = A,T,C or @
<400> 449
ccaagtteat gctntgtgct ggacgctgga cagggggcaa aagcnnttgc tcgtgggtca 60
ttotgamear egaactgace atgecagece tgccgatggt cotceatgge tecetagtge 120
cetggagagg aggtgtetag teagagagta gteetggaag gtggeetetg ngaggageea 180
cggggacago atoctgcaga tggtcgggcg cgtcccattc gccattcagg ctgcgcaact 240
sttgggaagg gcgatcggtg cgggcctctt cgctattacg ccagctggcg aaagggggat 300
gigcigciag gcgattaagi igggiaacgc cagggittic ccagtonoga cgiigtaaaa 360
cgacggccag tgaattgaat ttaggtgacn ctatagaaga gctatgacgt cgcatgcacg 420
cgtacgtaag cttggatect ctagagegge cgcctactae tactaaatte geggeegegt 480
coaceteges ternesetes gagagtegas agtgacatet getegacnet gterateas 540
cactgageag aagetggagg cacaacgene cagacactea cagetactea ggaggetgag 600
aacaggttga acctgggagg tggaggttgc aatgagctga gatcaggccn ctqcncccca 660
<210> 450
<211> 493
<212> DNA
<213> Homo sapiens
<400> 450
gaparggagt gtcartrigt tyrrcaggri ggagigrage aagaracigi riaagaaaaa 60
acagittias asggiassac aacstaassa qaastateet aisgiggasa tasgaqaqie 120
aaatgaggot gagaacttta caaagggato ttacagacat gtogocaata toactgoatg 180
agootaagta taagaacaac otttegggag aaaccatcat ttgacagtga ygtacaatto 240
ceaghcaggt agtgasatgg gtggasttes actcesatta strctgccag ctgssacgca 300
agagacacty tragagagtt asasagtysg ttrtatorat gaggtyattr caragtrite 360
toxagtoaac acatetgiga acteacagae caagtietta aaccaetgit caaactetge 420
taracateag aateacetgg agagetttae aaacteeeat tgeegagggt egaegeggee 480
gcgaatttag tag.
<210> 451
c211> 501
<212> DNA
<213> Homo sapiens
<220×
<221> misc_feature
<222> (1) ... {501}
\langle 223 \rangle n = A,T,C or G
<400> 451
9990309tcc cattegecat teaggetgeg caactgttgg gaagggegat eggtgeggge 60
ctetteyeta ttacyceage tygegaaagy gygatytyet geaaggegat taagttyggt 120
aacgccages ttttcccagt chosacgtts taaaacgacg gccagtgaat tgaatttags 180
tgamptata gaagagetat gacgtcgcat geacgegtac gtaagettgg atcetctaga 240
geggeegeet actactacta aactegegge egegtegaeg tgggateene actgagagag 300
tggagagtga catgtgctgg acmotgtoca tgaagcactg agcagaagct ggaggcacaa 360
cycnccagac actcacaget actcaggagg ctgagaacag gttgaacctg ggaggtggag 420
gitgeastga getgagatea ggeenetgen ecceageatg gatgacagag tgaaacteca 400
tettaaaaaa aaaaaaaaaa a
                                                                501
<210> 452
<211> 51
<212> DNA
<213> Romo sapiens
```

```
<220>
<221> misc feature
<222> (1)...(51)
<223> n = A,T,C or G
c400> 452
agacggtite acentiacaa encettitag gatgggnnit ggggageaag e
<210> 453
<211> 317
<212> DNA
<213> Homo gapiens
<220≻
<221> misc_feature
<222> (1) ... (317)
<223> n = A,T,C or G
<400> 453
tacatetige tititeccea tiggaactag teattaacce aletetgaac iggtagaaaa 60
acatotgaag agetagteta teageatetg geaagtgaat tggatggtte teagaaceat 120
ttcacccana cagoctyttt ctatoctytt taataaatta ytttyyytto totacatyca 180
taacaaaccc tgeteeaate tgteacataa aagtetgtga ettgaagttt anteageacc 240
cocaccaase titatitic tatgigitit tigeascata igagigitit gaasalaagg 300.
tacccatgtc tttatta
<210> 454
<211> 231
<213> DNA
<213> Homo sapiens
ttogaggtac aatoaactot cagagtgtag tttccttcta tagatgagte agcattaata 50
temperacyc cacyctotty emgagactet genttatect etyctosete agtegenees 120
agaagaccaa attettetge atcccagett gcaaacsaas tigitettet aggieteeac 180
ectteetttt teagtgitee aaageteete acaattteat gameaaeage t
<210> 455
<211> 231
<212> DNA
<213> Homo sapiens
<400> 455
taccasagag ggcataataa teagteteac agtagggtte accatectec aagtgaaaaa 60
cattetteeg kateggettt coacaggeta cacacacaaa acaegaaaca teccaagttt 120
etticaacec attgatgact totocaaega tottoottie goatoeacca cattoaegeg 180
caeagaattt ctcatagcac ageteaceat acagggetee tttctcctch a
<210> 456
<211> 231
<212> DNA
<213> Homo sapiens
tiggraggia coctiacaaa gaagacacca taccttaige gitaliaggi ggaataatca 6D
ttccattcag tattatcgtt attattcttg gagaaaccct gtctgtttac tgtaaccttt 120
tgcactcana ttcctttatc aggaetaact acatagecac tatttacana gccattggam 180
```

```
cotttttatt tggt9caget gotagtcagt cootgactga cattgccazg t
                                                                    231
 <210> 457
 <211> 231
 <212> DNA
 <213> Romo sapiens
 <220×
 <221> misc_feature
<222> (1)...{231}
\langle 223 \rangle n = A,T,C or G
<400> 457
cyaggiacco aggggiciga aastototon titantagio gatagossaa tigitostos 60
gcattcetta ataigatett getataatta gattittete cattagagit catacagitt 120
tatttgattt tattageaat etettteaga agaeeettga gateattaag etetgtatee 180
agtigicias ategatgeet cattircist gaggigings iggettings g
<210> 458
<211> 231
<212> DNA
<213> Homo Bapiens
<400> 459
aggictggit cocconacti coactococt etactototo taggactggg etgggccaaq ap
agaagaggg tggttaggga agccgttgag acctgaagcc ccaccctcta ccttccttca 120
acacectaac ettgggtaac ageatttgga attateattt gggatgagta gaattteeaa 180
ggtcctgggt taggcatttt ggggggccag accccaggag aagaagattc t
<210> 459
<211> 231
<212> DNA
<213> Homo sapiena
c400> 459
ggtaccgagg ctcgctgack cagagaaacc ccaacgcgag gaaaggaatg gccagccaca 60
cottogogia accompaged godcaccago cotalogogia caggacagag agacagagoa 120
georgeact gitticeete eaccacagee atectgicee teatiggete igigettice 180
actatacaca gteacegted caatgagaaa caagaaggag caccetecac a
<210> 460
<211> 231
<212> DWA
<213> Homo sapiens
c400> 460
gcaggtataa catgetgeaa caacagatgt gactaggaac ggceggtgac atggggaggg 60
cotateacce tattottggg ggetgettet teacagtgat catgaageet ageageaaat 120
cccacctccc cacacgraca cggccagcct ggagcccaca gaagggtoot cotgrageca 180
giggagetig giccageete cagiccacee ciaccagget taaggataga a
<210> 461
<211> 232
<212> DNA
<213> Komo sapiena
<400> 461
cgaggtttga gaagctctaa tgtgcagggg agccgagaag caggoggcct agggagggtc 60
```

```
Bogtgbgobo cagaagagtg tgbgcatgoo agaggggaaa caggogootg tgtgtootgg 120
gtggggttca gtgaggagtg ggaaattggt tcagcageac caagccgttg ggtgaataag 180
agggggatto catggcactg atagagecet atagttteag agetgggaat t
<210> 462
<211> 231
<212> DNA
<213> Homo sapiens
<400> 462
aggtaccete attgtagees tgggaaaatt gatgtteagt ggggateagt gaattaaatg 60
gggtcatgca agtataaaaa ttaaaaaaaa aagacttcat geecaatete atatgatgtg 120
gaagaactgt tagagagacc aacagggtag tgggttagag atttecagag tettacattt 180
totagaggag gtatttaatt tottotoact catcoagtgt tgtatttagg a
<210> 463
<211> 231
<212> DNA
<213> Homo sapiens
<400> 463
tactocagos tggtgacaga gogagacost atcacogoss cocacocoas caaaaaaaaa 6D
actgagtaga capptgtcct cttggcatgg taagtcttaa gtcccctccc agatctgtga 120
catttgacag gtgtctttte ctctggacct cggtgtcccc atctgagtga gaaaaggcag 180
tggggaggtg gatetteeag tegaageggt atagaageee gtgtgaaaag e
<210> 464
<211> 231
<212> DNA
<213> Homo sapiens
4400> 464
gtactotaag attitatota agttgootti totgggtggg aaagtttaac ottagtgact 60
aaggacatca catatgaaga atgtttaagt tggaggtggc aacgtgaatt gcaaacaggg 120
colgoberag tgactgtgtg cotgtagtco cagotactcg spagtotgtg tgaggccagg 180
ggtgccagcg caccagctag atgetetgta acttetagge cecattitice c
<210> 465
<211> 231
 <212> DNA
<213> Homo sapiens
 <4D0 > 465
catgitging tagotgiggt aatgorget goalctcaga cagggitaac thoagetect 60
gtggcaeatt agceacaeat tetgacatea tatttatggt ttetgtatet ttgttgatga 120
aggatggcae antititiget tgtgtteata atatacteag attagtteag etceateaga 180
 taaactogag acatgeagga cattagggta gtgttgtage tetggtaatg a
 <210> 466
 <211> 231
 <212> DNA
 <213> Homo mapiens
 c400> 466
 caggiactic titiccatigg atactgigct agcaagcatg citiccagggg titititaat 60
 ggocttogaa cagaacttgc cacataccca ggtataatag tttctascat ttgcccagga 120
 cetytyczat caaatattyt gyzyaattee etagetygag aagteacaaa gaetatzyge 18D
 aataatggag accastorca caasatsaca accastostt ststscssct s
```

> 나를 함께 되는 얼굴 모른 나무는 CAT PLANTE CONTRACT sala da interpetation A

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<210> 467
 <211> 311
 <212> DWA
 <213> Homo sapiens
 <400> 467
 gtaraccotg gracagtora atrigaactg giteggract catofficat gagatggatg 60
 tggtggcttt totocttttt catcaagact cotcagcagg gagcccagac cagcotgcac 120
 tgtgccttaa cagaaggtct bgagattcta agtgggaatc atttcagtga ctgtcatgtg 180
 gratgggtet rigrersage tegitaalgag actalageaa ggeggelgig ggaegicagi 240
 tgtgacctgc tgggcotocc aatagactaa caggcagtgc cagttggacc caagagaaga 300.
 ctgcagcaga c
 <210> 468
 <211> 3112
 <212> DNA
 <213> Homo sapiens
 <400> 468
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 aagatetgea tggtgggaag gacetgatga tacagagttt gataggagae aattaaagge 120
 togaaggrae togatocrto atoatogaot opactiticaa actooogcae tactogaaco 160
atgggatggc cagagacaca ggagatgagt tggagcaagc tcaataacaa aytggttcaa 240
cgaggaettg gaattgcatg gagetggage tgaagtttag cccaattgtt tactagttga 300
ptgaatgtgg atgattggat gateatttet catetetgag ceteaggtte eccateeata 360
aaetgggata cacagtatga totataaagt gggatatagt etgatotact toactgystt 420
attigaagga tgaatigaga taatttatti caggigoota gaacaatgoo cagattagta 480
catttggtgg aactgagaaa tggcataaca ccaaatttaa tatatgtcag atgttactat 540
gattateatt castetesta gittigicat ggcccastti atectesett gigcctesse 600
aaattgaact gitaacaaag gaatcictgg iccigggtaa iggcigagca ccacigagca 660
titecatice agriggette tigggitte tagetgeate actagreate traastassi 720
gaagttttaa cattteteea gtgatttett tateteacet ttgaagatae tatgttatgt 780
gattaaataa agaacttgag magaacaggt ttcattaaac ataaaatcaa tgtagacgca 840
astitictgg atgggcaata citatgitca caggaaatgc titaaaatat gcagaagata 900
attaaat990 aatg9acaaa gt9aaaaact tagacttttt ttttttttt g9aagtatct 960
ggatgtteet tagteactta aaggagaact gaaaaatage agtgagttee acataateea 1020
accigigaga tiaaggetet tigigggaa ggacaaagat eigiaaatti acagitteet 1080
tecasageca aegtegaatt tigsaacata teaaagetet tetteaagae aaataateta 1140
tagtacatet ttettatggg atgeacttat gaaaaatggt ggetgteaac atetagteae 1200
tttogetete aasatggtte ottttaagag aasgttttag apteteatat ttatteetgt 1260
ggaaggacag cattgigget iggaciitat aaggiettia ticaactaaa taggigagaa 1320
ataagaaagg ctgctgactt taccatctga ggccacacat ctgctgaaat ggagataatt 1380
aacatcacta gaaacagcaa gatgacaata taatgtctaa gtagtgacat gtttttgcac 1440
atticcages cettimenta tesacacasa caggangens annaggangs acagagates 1500
ctgggagaaa tgcccggccg ccatcttggg tcatcgatga gcctcgccct gtgcctggtc 1560
ccgcttgtga gggaaggaca ttagaaaatg aattgatgtg ttccttaaag gatgggcagg 1620
aaaacagatc ctgttgtgga tatttatttg aacgggatta cagatttgaa atgaagtcac 1680
aaagtgagca ttaccaatga gaggaaaaca gacgagaaaa tottgatggo ttoacaagac 1740
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accacgogge agagggteag gattetogge etgetgeeta aactgtoogt teataaccaa 1860
atcatttcat atttctaacc ctcaaaacaa agctgttgta atatctgatc tctacggttc 1930
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<213> Homo sapiens

<400> 477

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His His His Thr His Glu His Thr Asp Thr Leu Pro Tyr Gly His Trp 50 55 60

His Thr His Cys His Thr Val Thr Trp Thr His Leu His Thr Ile Thr 65 70 75 80

Pro Pro His Thr Leu Pro Val Asp Thr Arg Thr His Arg His Cys His 95 90

Thr Asp Thr Gln Asp Thr Val Thr Arg Arg His His His Ala Asp Thr 100 105 110

Pro Pro Leu Trp Cys Arg Leu Asn Tyr Pro Ala Gly Gly Thr Ala Val 115 120 125

Ala Tyr Ser Cys Leu Ser Asp Trp Leu Ser Pro Gln 135 140

<210> 478

<211> 143

<212> PRT

<213> Homo sagiens

<400> 478

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Ser His Gly His Thr Gly Ils Val Thr Trp Thr Asp Thr Gln Thr Tyr
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Gly Glu Ile Thr Trp Thr His His His Thr Ile Thr Gly Thr Gln Thr 35 40 45

His Gly Asp Ile Thr Thr Trp Thr His Cys His Thr Thr Thr Gly Thr 50 55 60

Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Aon Thr
65 70 75 80

Pro Thr His Cys His Met Asp Thr Gly Thr His Thr Ala Thr Leu Ser

His Gly His Thr Ser Thr Pro Ser His His His Thr His Cyo Lou Trp 110 105 Thr Glo Gly His Thr Asp Thr Val Thr Glo Ile His Lys Thr Leu Ser 120 His Gly Asp Ile Thr Met Gln Ile His His His Ser Gly Ala Val 130 <210> 479 <211> 222 <212> PRT <213> Homo sapiens <400> 479 Met Tyr Arg His Thr Glu Thr Leu Pro His Gly Asp Thr Val Thr Gln Ser Ris Glu His Thr Gly Ile Val Thr Trp Thr Asp Thr Gln Thr Tyr 25 30 Gly Glu Ile Thr Leu Thr His His His Thr Ile Thr Gly Thr Gln Thr 4 D His Gly App Ile Thr Thr Try Thr His Cys His Thr Thr Thr Gly Thr Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Asn Thr Pro Thr His Cys His Met Asp Thr Ala Thr His Thr Ala Thr Leu Ser Mie Gly His Thr Ser Ile Pro Ser His His His Thr His Cys His Val ASP Thr Arg Thr His Arg His Cys His Thr Asp Thr Gln Asn Thr Val 120 The Arg Arg His His His Ala Asp The Pro Pro His Gly His Ser Thr Arg His Ser Ala Thr Gln Ile His His His Thr Glu Met Arg Thr His 150 Cys His Thr Asp Thr Thr Thr Ser Leu Pro His Phe His Val Ser Ala 170 Gly Gly Val Gly Pro Thr Thr Leu Gly Ser Asn Arg Glu Ile Thr Trp The Tyr Ser Glu Gly Lys Ile Phe Phe Tyr Phe Leu Gly Agn Gln Ala 200 Arg Leu Cys Leu Lys Lys Arg Lys Lys Gln Tyr Thr Val

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<211> 144

<212> PRT

<213> Homo sapiens

<400> 480

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Val Gly Phe Leu Val Val Lys Arg Gln Thr Ile Gly Arg Leu Glu Arg

Asp Phe Met Phe Lys Cys Arg Lys Cln Pro Cly Leu Pro Pro Ser Gly

Leu Cys Leu Leu Trp Pro Trp Pro Asn Leu Glu Phe Gly Arg Arg Gln

Asp Arg Leu Thr Trp Ser Ser Val Ser Val Ala Gly Val Cys Ala Cys

Arg Ala Arg Pro Gly Tro Leu Gly Glu Gln Pro Ala Thr Ser Ala Gly 105

Val Arg Leu Glu Gla Val Glu Gla Pro Pro Ala His Pro Leu Gla Glu

Ala Gly Val Ala Arg Phe Pro Arg Pro Glu Trp Val Pro Pro Asn Gly 130 135

<210> 481

<211> 167

<212> PRT

<213> Homo sapiens

<400> 481

Met His Gly Pro Gln Val Leu Ala Arg Cys Ser Glu Cys Ala Cys Pro

Ala Leu Ala Ala Thr Ser Ala Gly Val Arg Leu Glu Gly Val Asp Arg 20

Pro Pro Thr Leu Pro Ser Gln Gly Ser Gly Trp Pro Cys Ser His Ser

Leu Ser Gly Cys Ris Leu Met Ala Asp Gly Ala Lys Ala Leu Gly Lys 55

Al Asp Gly Pro Trp Pro Tyr Leu Phe Val Arg Arg Thr Asp Val Pro

75 70 Б\$ Cys Pro Ala Ala Ser Glu Val Gly Gly Cys Ala Pro Ser Ser Trp Arg Ala Leu Ala Glu Val Thr Gly Cys Ser Leu Gly Fro Leu Gly Leu Ala Gin His Ala Glm Ala Ser Val Leu Leu Leu Cys Tyr Lys Trp Ser His 120 Ile Gly Glu Thr Ser Ser His Leu Arg Ser Lys Val Tyr Ala Ala Phe 135 Gly Gly Ser Ser Pro Cys Leu Lys Gly Leu Met Ser Leu Trp Ala Ser Trp Leu Ser Arg Gly Arg Pro 165 <210> 482 <211> 143 <212> PRT <213> Homo sapiens <4C0> 482 Met Glu Pro Tyr Arg Cly Asn Lys Lys Gln Val Cln Clu Lys Gly Val Pro Cys Leu Trp Cly Ser Ser Pro Cys Leu Arg Cys His Met Ala Leu Arg Ala Ser Trp Leu Pro Gly Gly Gly Pro Gln Ala Ile Leu Gly Arg Thr Leu Cys Ser Ser Ala Glu Ser Ser Gln Asp Cys His Pro Gly Gly Pro Ser lie Ala Leu Ala Lys Pro Cys Arg Gly Val Trp Leu Leu Phe Glu Pro Ala Tro Pro Pro Tro His Ala Arg Ala Pro Gly Ala Cly Thr Leu Leu Arg Val Cys Leu Ser Cys Leu Gly Cys His Leu Cys Gly Gly 105 Ala Ser Gly Gly Gly Pro Ala Thr Asn Leu Thr Gln Ser Arg Lys

Trp Met Ala Met Phe Pro Gln Pro Glu Trp Leu Pro Pro Asp Gly

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<211> 143
<212> PRT

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<213> Homo gapiens
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<400> 483

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Cly Pho Lou Val Ala Lys Arg Arg Thr Thr Gly Leu Leu Glu Glu Asp 35 40

Phe Thr Phs Lys Cys Arg Lys Gln Pro Lys Leu Pro Ser Met Arg Leu 50 55 60

Ser Leu Leu Trp Pro Trp Arg Asp Leu Lys Phe Val Pro Arg Gln Asp 65 70 75 80

Lys Leu Thr Arg Ser Ser Val Ser Val Ala Gly Ala Tyr Ala Cys Arg 85 90 95

Ala Gly Pro Gly Try Leu Lys Glu Gln Pro Ala Thr Ser Ala Arg Val

Arg Leu Val Glu Ala Glu His Pro Pro Pro His Pro Leu Glu Glu Val

Gly Met Ala Arg Phe Pro Gln Pro Gln Cys Leu Pro Pro Tyr Cys 130 135 140

<210> 484

<211> 30

c212> PRT

c213> Homo Sapien

<400> 404

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1 5 10 15

Ala Ile Pro Ile Gly Gln Ala Met Ala Ile Ala Gly Gln Ile

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<223> Made in a lab

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     <210> 488 ·
      <211> 33
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Ser Val Ala
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      <223> Made in a lab
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Leu Ser His Ser
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<211> 20
     <212> PRT
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<213> Artificial Sequence
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      <400> 491
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Thr Gly Phe Thr
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      <211> 20
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      <22D>
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      <40D> 492
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                                    10
                                                        15
Leu Ala Ser Leu
            20
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      c211> 20
      <212> PRT
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      <220>
      <223> Made in a lab
      <400> 493
Tyr Thr Leu Ala Ser Leu Tyr His Arg Glu Lys Gln Val Phe Leu Pro
                                    10
Lys Tyr Arg Gly
          20
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      <2115 20
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     ₹210> 495
     <211> 20
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• 1
Phe Pro Ass Gly
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    <211> 21
     <212> PRT
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     <223> Made in a lab
    <400> 496
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c210> 497
     ₹211> 20
     <212> PRT
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     <220>
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Ser Val Arg Val
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Val Pro Gly Arg
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<223> Made in a lab
       <400> 499
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 Ser Ala Phe Leu
             2D
       <210> 500
       <211> 20
       <212> PRT
       <213> Artificial Sequence
       <220>
      <223> Nade in a lab
      <400> 500
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                                     10
Gly Ser Ile Val
            20
      <210> 501
      <211> 20
      <212> PRT
      <213> Artificial Sequence
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      <223> Made in a lab
      <900> 501
Phe Met Cly Ser Ile Val Cln Leu Ser Gln Ser Val Thr Ale Tyr Met
 ž
Val Ser Ala Ala
            20
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      <211> 414
      <212> DNA
      <213> Romo Sapien
      <220>
      <221> misc_feature
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      <400> 502
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                                                                       120
ctgtagagtt tttggeatng acctcagtag caatgcaatg agetgggtec gccaggetcc
                                                                       180
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gmaaggccga tinainatti ccaaaaccin gaccacggig gattigaaaa igaccagicc
gacaaccgag gacaoggeca ectatititg tggcagaatg aatactggta atagtggttg
                                                                       360
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      <210> 503
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<211> 379

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<213> Homo Sapiens
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      <222> (1) ... (379)
      \langle 223 \rangle n = A,T,C or G
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agetatggag tgagetgggt cogccagget ccagggaagg ggetggnata categgatea
                                                                        180
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                                                                        240
cotngaccae ggtggatttg assatcacca gtttgacsac cgaggacaeg gecaectatt
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Entgtgccag aggggggttt aattataaag acatttgggg cocaggcacc ctggtcaccg
                                                                        360
                                                                        379
thteettagg gcaacctaa
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      <211> 19
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      <213> Artificial Sequence
      <220>
      <223> Made in a lab
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Asn Ser Ala
      <210> 505
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <22D>
      <223> Made in a lab
      <400> 505
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                                     10
Asn Thr Ala Asn
            20
      <210> 506
      <211> 407
      <212> DNA
      <213> Homo Sapien
      <400> 506
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                                                                        12D
                                                                        180
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saggggttgg sataratogg atsosttagt tatggtggta gcgcatacta cgcgagctgg
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                                                                        300
ctgacaaccg aggacacggc cacctatttc tgtgccagaa atagtgattt tagtggtatg
                                                                        36
                                                                        407
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<210> 507
        <211> 422
        <212> DNA
        <213> Homo Sapien
        <400> 507
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                                                                         120
  apagtetetg gatteteset eageaactae gacetgaact gggtesgesa ggetesaggg
                                                                         180
 aaggggctgg aatggatcgg gatcattaat tatgttggta ggacggacta cgcgaactgg
                                                                         240
 geassaggee ggtteseest etecsassee togseeseeg tggstetess gstogeesgt
                                                                        3 D O
 ergaceaceg aggacacege caretattte tgtgcragag ggtggaagtg cgatgagtet
                                                                        360
 ggtccgtget tgcgcatctg gggcccaggc accetggtca cegteteett agggcaacet
                                                                         420
 aa
                                                                         422
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       <213> Homo Sapiens
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       <221> misc_feature
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       <223> n = A, T, C or G
       <400> 508
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                                                                        120
 castetetss aatesacete astasetaet scatsasets seteceses setecasses
                                                                        180
 AGGGGCtGGA AtgGatcGGA AtcattgGta ctcctgGtga cacatactac gcgaggtggg
                                                                        240
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                                                                        300
 ogacaacoga ggacacggcc acctatitci gigccagaga tcitcgggai ggiagiagia
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Cly
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Asn Gly Glu Asp Cys Ser Pro His Ser Gln Pro Trp Gln Ala Ala Leu
                        . 40
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Val Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val Hit Pr Gln
                         55
 Trp Val Lou Sor Ala Thr His Cys Phe Gln Aon Ser Tyr Thr Ile Gly
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                     70
                                          75
 Leu Gly Leu His Ser Leu Glu Ala Amp Gln Glu Pro Gly Ber Gln Met
                                      90
 Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
                                                      110
 Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
                             120
 Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cyc Pro Thr Ala
                         135
 Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Lsu Leu Ala Asn Gly Arg
 145
                     150
                                         155
Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu Glu
                                     170
Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
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Ala Gly Gly Gly Gln Kaa Gln Kaa Asp Ser Cys Asn Gly Asp Ser Gly
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Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly
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                                             220
Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn Leu
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4 D
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Trp Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly
Lou Gly Lou His Ser Lou Glu Ala Asp Gln Glu Pro Gly Ser Gln Met
Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
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Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
                            129
Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala
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Gly Asn Ser Cys Leu Val Ser Gly Tro Gly Leu Leu Ala Asn Gly Arg
                   15D
                                        255
Met Pro Thr Val Leu Glo Cye Val Aso Val Ser Val Val Ser Glu Glu
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Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
                                185
Ala Gly Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly
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Gly-Pro-Leu-Fle-Cys-Asn-Gly-Tyr-Leu-Gln-Gly-Leu-Val Ser-Phe-Gly-
                                            220 '
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                        215
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- Arg Thr Glu Arg Ser Leu His Ala Pro Met Tyr Leu Phe Leu Cys Met 50 55 60
- Leu Ala Ala Ile Asp Leu Ala Leu Ser Thr Ser Thr Net Pro Lys Ile 55 70 80
- Leu Ala Leu Phe Trp Phe Asp Ser Arg Glu Ile Ser Phe Glu Ala Cyc 85 90 95
- Leu Thr Gln Met Phe Phe Ile His Ala Leu Ser Ala Ile Glu Ser Thr
  100 105 110
- Ile Leu Leu Ala Met Ala Phe Asp Arg Tyr Val Ala Ile Cys Ris Pro 115 120 125
- Leu Arg His Ala Ala Val Leu Asn Asn Thr Val Thr Ala Glm Ile-Gly 130 140
- Ile Val Ala Val Val Arg Gly Ser Leu Phe Phe Phe Pro Leu Pro Leu 145 150 155 160
- Leu Ile Lys Arg Leu Ala Phe Cys His Ser Asn Val Leu Ser His Ser 155 170 175
- Tyr Cys Val His Gln Asp Val Met Lys Leu Ala Tyr Ala Asp Thr Leu 180 185 190
- Pro Asn Val Val Tyr Gly Leu Thr Ala Ile Leu Leu Val Met Gly Val 195 200 205
- Asp Val Met Phe Ils Ser Leu Ser Tyr Phe Leu Ils Ils Arg Thr Val 210 215 220
- Leu Gln Leu Pro Ser Lys Ser Glu Arg Ala Lys Ala Phe Gly Thr Cys 225 230 235 240
- Val Ser His Ile Gly Val Val Leu Ala Phe Tyr Val Pro Leu 1le Gly 265 250 255
- Leu Ser Val Val His Arg Phe Gly Asn Ser Leu His Pro Ile Val Arg 260 265 270
- Val Val Met Gly Asp Ile Tyr Leu Leu Pro Pro Val Ile Asn Pro 275 280 285
- Ile Ile Tyr Gly Ala Lys Thr Lys Gln Ile Arg Thr Arg Val Leu Ala 290 295 300
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galgaalgig cgltaatgit gctggaacal ggcaclgalc caaatattcc agalgagtat 540
ggaastacca ctctacacta tgctgtctac satgaagsta aattaatggc casagcactg 600
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ggtataeatg ageacacaca geaagtggtg asatttttaa teaagaacaa agegaattta 720
satgcgctgg atagatatgg aagaactgct ctcatacttg ctgtatgttg tggatcagca 780
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Val Lys Thr Leu Gly Ser Lys Arg Cys Lys Trp Cys Cya His Cys Phe
                             90
Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val Val Ala Trp Gly Asp
Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr His Val His Gly Glu
                     7 D
Asp Leu Asp Lys Leu His Arg Ala Ala Trp Trp Cly Lys Val Pro Arg
Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Arg Asp
                               105
Lys Gln Lys Arg Thr Als Leu His Leu Als Ser Als Asn Gly Asn Ser
Glu Val Val Lys Leu Val Leu Asp Arg Arg Cys Gln Leu Asn Val Leu
   130
                       135
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<400> 534

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                        215
Gin Lys Cin Cin Val Val Lys Dhe Leu Ile Lys Lys Lys Ala Asn Leu
                   230
                                        235
Asn Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cys
                245
                                    250
Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Glu Glu Asn Val Asp
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Val Ser Ser Gln Asp Leu Glu Arg Arg Pro Glu Ser Met Leu Phe Leu
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Val Ile Ile Met
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<213> Homo sapiens
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المستحدد

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Ċys	Ile	Суа	Gln 580	Ile	Leu	His	Glu	<b>Lув</b> 585	Ile	Thr	Ile	Leu	Val [*] 590	Thr	His
Gln	Leu	Gln 595	Тух	Leu	Lys	Ala	Ala 600	Ser	Gln	Ile	Гел	Ile 605	Leu	ГÀВ	Aep
ĠĮΆ	Lye 610	Met	Val	<b>Gln</b>	Lys	01y 615	Thr	Tyr	Thr	Glu	Phe 620	Leu	ГÀÈ	Ser	gīy
Ile 625	Авр	Phe	Gly	8er	Lau 630	Leu	Lув	Lya	Asp	Asn 635	<b>G</b> lu	Glu	Ber	Glu	Gln 640
Pro	Pro	Val	Pro	Gly 6 <b>45</b>	Thr	Pro	Thr	Ĺęv	Arg 650	Agn	Arg	Thr	Phe	\$er 655	Glu
	Звг		Trp 660	Ser	Gln	Gln		Ser 665	Arg	Pro	ŝer		Lув 670	Asp 、	Gly

Ala Leu Glu Ser Gln Asp Thr lu Asn Val Pro Val Thr Leu Ser Glu 675 680 685

Glu Asn Arg Ser Glu Gly Lys Val Gly Phe Gln Ala Tyr Lys Asn Tyr Phe Arg Ala Gly Ala His Trp Ile Val Phe Ile Phe Leu Ile Leu Leu 710 Asn Thr Ala Ala Gln Val Ala Tyr Val Leu Gln Asp Trp Trp Leu Ser Tyr Trp Ala Asn Lys Oln Ser Met Leu Asn Val Thr Val Asn Gly Gly 745 Gly Asn Val Thr Glu Lys Leu Asp Leu Asn Trp Tyr Leu Gly Ile Tyr 76**0** Ser Gly Leu Thr Val Ala Thr Val Leu Phe Gly Ile Ala Arg Ser Leu Leu Val Phe Tyr Val Leu Val Asn Ser Ser Gln Thr Leu His Asn Lys 795 Met Phe Glu Ser Ile Leu Lys Ala Pro Val Leu Phe Phe Asp Arg Asn 810 8D5 Pro Ile Cly Arg Ile Lau Asn Arg Phe Sar Lys Asp Ile Cly Ris Leu 825 Asp Asp Leu Leu Pro Leu Thr Phe Leu Asp Phe Ile Gln Thr Leu Leu 840 Gin Val Val Gly Val Val Ser Val Ala Val Ala Val Ile Pro Trp Ile Ala Ile Pro Leu Val Pro Leu Gly Ile Ile Phe Ile Phe Leu Arg Arg. 870 Tyr Phe Leu Glu Thr Ser Arg Asp Val Lys Arg Leu Glu Ser Thr Thr Arg Ser Pro Val Phe Ser His Leu Ser Ser Ser Leu Gln Gly Leu Trp Thr Ile Arg Ala Tyr Lys Ala Glu Glu Arg Cys Gln Glu Leu Phe Asp 920 925 Ala His Gln Asp Leu His Ser Glu Ala Trp Phe Leu Phe Leu Thr Thr 935 Ser Arg Trp Phe Ala Val Arg Leu Asp Ala Ile Cys Ala Met Phe Val Ile Ile Val Ala Phe Gly Ser Leu Ile Leu Ala Lys Thr Leu Asp Ala

Gly Gln Val Gly Leu Ala Leu Ser Tyr Ala Leu Thr Leu Met Gly Met

Phe Gln Trp Cye Val Arg Gln Ser Ala Glu Val Glu Asn Met Met Ile

995 1000 1005

Ser Val Glu Arg Val Ile Glu Tyr Thr Asp Leu Glu Lys Glu Ala Pro 1010 1015 1020

Trp Glu Tyr Gln Lys Arg Pro Pro Pro Ala Trp Pro His Glu Gly Val 1025 1030 1035 1040

Ile Ile Phe Asp Asn Val Asn Phe Met Tyr Ser Pro Gly Gly Pro Leu 1045 1050 1055

Val Leu Lys His Leu Thr Ala Leu Ile Lys Ser Gln Glu Lys Val Gly 1060 1065 1070

Ile Val Gly Arg Thr Gly Ala Gly Lys Ser Ser Leu Ile Ser Ala Leu 1075 1080 1085

Phe Arg Leu Ser Glu Pro Glu Gly Lys Ile Trp Ile Amp Lys Ile Leu 1090 1095 1100

Thr Thr Glu Ile Gly Leu Ris Asp Leu Arg Lys Lys Met Ser Ile Ile 1105 1110 1115 1120

Pro Gln Glu Pro Val Leu Phe Thr Gly Thr Met Arg Lys Asn Leu Asp 1125 1130 1135

Pro Phe Asn Glu His Thr Asp Glu Glu Leu Trp Asn Ala Leu Glu Glu 1140 1145 1150

Val Gln Leu Lys Glu Thr Ile Glu Asp Leu Pro Gly Lys Met Asp Thr 1155 1160 1165

Glu Leu Ala Glu Ser Gly Ser Asn Phe Ser Val Gly Gln Arg Gln Leu 1170 1175 1180

Val Cys Leu Ala Arg Ala Tie Leu Arg Lys Asn Oln Ile Leu Ile ile 1185 1190 1195 1200

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Leu Glu Gly Phe Trp Asp Lys Glu Val Leu Arg Ala Glu Asn Asp Ala 20 25 30

Gln Lys Pro Ser Leu Thr Arg Als Ile Ile Lys Cys Tyr Trp Lys Ser 35 40 45

- Tyr Leu Val Leu Gly Ile Phe Thr Leu Ile Glu Glu Ser Ala Lys Val
- Ile Gln Pro Ile Phe Leu Gly Lys Ile Ile Asn Tyr Phe Glu Asn Tyr 65 70 75 80
- Asp Pro Met Asp Ser Val Ala Leu Asm Thr Ala Tyr Ala Tyr Ala Thr 85 90 95
- Val Leu Thr Phe Cys Thr Leu Ile Leu Ala Ile Leu His His Leu Tyr
  100 105 110
- Phe Tyr His Val Gln Cys Ala Gly Met Arg Leu Arg Val Ala Met Cys 115 120 125
- His Met Ile Tyr Arg Lys Ala Leu Arg Leu Ser Asn Met Ala Met Gly
  130 135 140
- Lys Thr Thr Gly Gln Ile Val Asn Leu Leu Ser Asn Asp Val Asn 145 150 155 160
- Lys Phe Asp Gln Val Thr Val Phe Leu His Phe Leu Trp Ala Gly Pro 165 170 175
- Leu Gln Ala Ile Ala Val Thr Ala Leu Leu Tro Met Glu Ile Gly Ile 180 185 190
- Ser Cys Leu Ala Gly Met Ala Val Leu Ile Ile Leu Leu Pro Leu Gln
  195 200 205
- Ser Cys Phe Gly Lys Leu Phe Ser Ser Leu Arg Ser Lys Thr Ala Thr 210 215 220
- Phe Thr Asp Ala Arg Ile Arg Thr Met Asn Glu Val Ile Thr Gly Ile 225 230 235 240
- Arg Ile Ile Lys Met Tyr Ala Trp Glu Lys Ser Phe Ser Asn Leu Ile 245 250 255
- Thr Asn Leu Arg Lys Lys Glu Ile Ser Lys Ile Leu Arg Ser Ser Cys. 260 265 270
- Leu Arg Gly Met Asn Leu Ala Ser Phe Phe Ser Ala Ser Lys Ile Ile 275 280 285
- Val Phe Val Thr Phe Thr Thr Tyr Val Leu Leu Gly Ser Val Ile Thr 290 295 300
- Ala Ser Arg Val Phe Val Ala Val Thr Leu Tyr Cly Ala Val Arg Leu 305 310 315 320
- Thr Val Thr Leu Phe Phe Pro Ser Ala Ile Glu Arg Val Ser Glu Ala 325 330 335
- Ile Val Ser Ile Arg Arg Ile Gln Thr Phe Leu Leu Leu Asp Glu Ile 340 345 350

Trine.

Ser Gln Arg Asn Arg Gln Leu Pro Ser Asp Gly Lys Lys Met Val His 355 360 J65

Val Gln Asp Phe Thr Ala Phe Trp Asp Lya Ala Ser Glu Thr Pro Thr 370 375 380

Leu Gln Gly Leu Ser Phe Thr Val Arg Pro Gly Glu Leu Leu Ala Val 385 390 195 600

Val Gly Pro Val Gly Ala Gly Lys Ser Ser Leu Leu Ser Ala Val Leu
405 410 415

Gly Glu Leu Ala Pro Ser His Gly Leu Val Ser Val His Gly Arg Ile 420 425 430

Ala Tyr Val Ser Gln Gln Pro Trp Val Phe Ser Gly Thr Leu Arg Ser 435 440 445

Ash lie Leb Phe Gly Lys Lys Tyr Glu Lys Glu Arg Tyr Glu Lys Val 450 455 460

Ile Lys Ala Cys Ala Leu Lys Lys Asp Leu Cin Leu Ciu Asp Ciy 465 470 475 480

Asp Leu Thr Val Ile Gly Asp Arg Gly Thr Thr Leu Ser Gly Gly Gln 485 490 495

Lys Ala Arg Val Asn Leu Ala Arg Ala Val Tyr Gln Asp Ala Asp Ile 500 505 510

Tyr Leu Leu Asp Asp Pro Leu Ser Ala Val Asp Ala Glu Val Ser Arg 515 520 525

His Leu Phe Glu Leu Cys Ile Cys Gln Ile Leu His Glu Lys Ile Thr 530 535 540

Ile Leu Val Thr His Glm Leu Glm Tyr Leu Lys Als Ala Ser Glm Ile 555 550 560

Leu Ile Leu Lys Asp Gly Lys Met Val Gln Lys Gly Thr Tyr Thr Glu 575

Phe Leu Lys Ger Gly Ils Asp Phe Gly Ser Leu Leu Lys Lys Asp Asn 580 585 585

Glu Glu Ser Glu Gln Pro Pro Val Pro Gly Thr Pro Thr Leu Arg Asn
595 600 605

Arg Thr Phe Ser Glu Ser Ser Val Trp Ser Gln Gln Ser Ser Arg Pro 610 615 620

Ser Leu Lys Asp Gly Ala Leu Glu Ser Gln Asp Thr Glu Asn Val Pro 635 640

Val Thr Leu Ser Glu Glu Asn Arg Ser Glu Gly Lya Val Gly Phe Gln
645 650 655

Ala Tyr Lys Asn Tyr Phe Arg Ala Gly Ala His Trp Ile Val Phe Ile

	665	670
660		
he Leu Ile Leu Leu Asn T 675	7	
6911		
Thr Vel Ash Gly Gly Gly 7		
Tyr Leu Gly Ile Tyr 8er (	14 Control of the Con	•
Ile Ala Arg Ser Leu Leu 740		
Thr Lev His Asn Lys Met 755	,,,,,	
Phe Phe Asp Arg Asn Pro-	Ile-Gly arg_Ile_Leu	Asn Arg Phe Ser Lys
770	113	
Amp Ile Gly Him Leu Amp 785 790		
Ile Gln Thr Leu Leu Gln 805	· ·	
Val Ile Pro Trp Ile Ala 820	<b>v</b> = <b>v</b>	•
lle Phe Leu Arg Arg Tyx 835	V - V	•
Leu Glu Ser Thr Thr Arg	000	
Leu Gln Gly Leu Trp Thi	•	•
Gln Glu Leu Phe Asp Al		• •
Lev Phe Leu Thr Thr Se		. ,
Cys Ala Met Phe Val Il	320	
930	737	la Leu Ger Tyr Ala Leu 940
945	<b></b>	rg Gln Ser Ala Glu Val 960
Glu Asn Met Met Ils S	er Val Glu Arg Val I	le Glu Tyr Thr Asp Leu 975

- Glu Lys Glu Ala Pro Trp Glu Tyr Gln Lys Ary Pro Pro Pro Ala Trp 980 985 990
- Pro Bis Glu Gly Val Ile Ile Phe Asp Asn Val Asn Phe Met Tyr Ser 995 1000 1005
- Pro Gly Gly Pro Leu Val Leu Lys His Leu Thr Ala Leu Ile Lys Ser 1010 1015 1020
- Gin Glu Lys Val Gly Ile Val Gly Arg Thr Gly Ale Gly Lys Ser Ser 1025 1030 1035 1040
- Leu Ile Ser Ala Leu Phe Arg Leu Ser Glu Pro Glu Gly Lya Ile Trp 1045 1050 1055
- Ile Asp Lys Ile Leu Thr Thr Glu Ile Gly Leu His Asp Leu Arg Lys
- Lys Met Ser Ile Ile Pro Gin Giu Pro Val Leu Phe Thr Gly Thr Met 1075 1080 1085
- Arg Lys Asn Leu App Pro Phe Asn Glu His Thr Asp Glu Glu Leu Tro
- Asn Ala Leu Gln Glu Val Gln Leu Lys Glu Thr Ile Glu Asp Leu Pro 1105 1110 1115 1120
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- Gln Ile Leu Ile Ile Asp Glu Ala Thr Ala Asn Val Asp Pro Arg Thr 1155 1160 1165
- . Asp Glu Leu Ile Gln Lys Lys Ile Arg Glu Lys Phe Ala Bis Cys Thr 1170 1175 1180
- Val Leu Thr Ile Ala His Arg Leu Ann Thr Ile Ile Asp Ser Asp Lys 1185 1190 1195 1200
- Ile Met Val Leu Asp Ser Gly Arg Leu Lys Glu Tyr Asp Glu Pro Tyr 1205 1210 1215
- Val Leu Leu Glm Asm Lys Glu Ser Leu Phe Tyr Lys Met Val Glm Glm 1220 1225 1230
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